# SL-C30E/C30UB
## RMT-216

# SERVICE MANUAL

*AEP Model*
*UK Model*
*E Model*

SL-C30E AEP MODEL

July, 1983

## 711B CHASSIS

**Also refer to ADJUSTMENT MANUAL.**

### SPECIFICATIONS

| | |
|---|---|
| **System** | |
| Video recording system | Rotary two-head helical scanning |
| Video signal | CCIR standards, PAL colour |
| Aerial input | 75-ohm, asymmetrical aerial socket |
| Channel coverage | VHF : Western European channels E2-12<br>UHF : Western European channels E21-68<br>(Up to 12 programmes can be preset.)<br>} AEP , E model |
| | UHF : European channels 21-68<br>(Up to 12 programmes can be preset.)<br>} UK model |
| RF output signal | UHF channels E30 to E39 (variable)<br>75 ohms, unbalanced |
| **Video** | |
| Input | VIDEO IN : BNC connector<br>$1.0\ \mathrm{V}\ ^{+1.0}_{-0.5}\ \mathrm{V}$ (p-p)<br>75 ohms, unbalanced,<br>sync negative |
| Output | VIDEO OUT : BNC connector<br>1.0 V (p-p) ±0.1 V (p-p)<br>75 ohms, unbalanced,<br>sync negative |
| Horizontal resolution | 260 lines |
| Signal-to-noise ratio | Colour : Better than 40 dB<br>B/W : Better than 43 dB |
| **Audio** | |
| Input | AUDIO IN : phono jack<br>47 kilohms, −10 dBs (0 dBs = 0.775 V rms) |
| Output | AUDIO OUT : phono jack<br>Load impedance less than 10 kilohms<br>−10 dBs with 47 kilohms load, unbalanced |
| Frequency response | 50 Hz to 10 kHz |
| Signal-to-noise ratio | 40 dB |
| Audio distortion | Less than 4% at 400 Hz |
| **Tape transport** | |
| Tape speed | 18.73 mm/sec. |
| Maximum recording time | 2 hours 10 min. (with Sony L-500 cassette)<br>3 hours 15 min. (with L-750) |
| Fast forward/rewind time | Within 5 min. (with L-500) |
| **Timer** | |
| Clock | Crystal lock |
| Time indication | 24-hour cycle |
| Timer setting | Only for recording<br>2 events/week, adjustable for any day or for all 7 days of the week |
| Power back-up | Back-up duration of 3 minutes at one time |
| **General** | |
| Power requirements | 220 V ac ± 10%, 50/60 Hz ..... AEP model<br>110, 127, 220, 240 V ac, adjustable<br>50/60 Hz ..... E model<br>240 V ac ±10%, 50/60 Hz ..... UK model |
| Power consumption | 38 W |
| Storage temperature | −20°C to +65°C (−4°F to +149°F) |
| Operating temperature | 5°C to 40°C (41°F to 104°F) |
| Dimensions | Approx. 430 × 105 × 360 mm (w/h/d)<br>($17 \times 4^{1}/_{4} \times 14^{1}/_{4}$ inches)<br>including projecting parts and controls |
| Weight | Approx. 10 kg (22 lbs 1 oz) net |

– Continued on next page –

Beta
ß VIDEO CASSETTE RECORDER
SONY®

MICROFILM

Consumer
VIDEO

**Accessories supplied**

| | |
|---|---|
| 75-ohm coaxial cable for recorder to TV connection | 1 |
| Remote control unit RMT-216 with two IEC designation R6 batteries | 1 |
| RF channel adjustment tool | 1 |

Design and specifications subject to change without notice.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

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# SECTION 1
# GENERAL

## 1-1. PRECAUTIONS

**On safety**

- This unit operates on 220V ac, 50/60 Hz...... AEP model
- This unit operates on 240V ac, 50/60 Hz...... UK model
- This unit operates on 110, 127, 220, 240V ac, adjustable 50/60 Hz..... E model
- Should any solid object or liquid fall into the cabinet, turn off the unit and have it checked by qualified personnel before operating it any further.
- To disconnect the mains lead (ac power cord), pull it out by the plug. Never pull the lead itself.

**On installation**

- Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation grille.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Keep the unit and cassette tapes away from equipment with strong magnets, such as a microwave oven, large loudspeakers, etc.

**On operation**

- When the unit is not to be used for a long period, turn the power off to conserve energy and to extend the useful life of your unit.
- Remove and store video cassettes after recording or playback.

**On cleaning**

Clean the cabinet, panel and controls with a dry soft cloth. Do not use a moistened cloth or any type of solvent, such as alcohol or benzine, which might damage the finish.

**On repacking**

Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.

**On colour broadcasting systems**

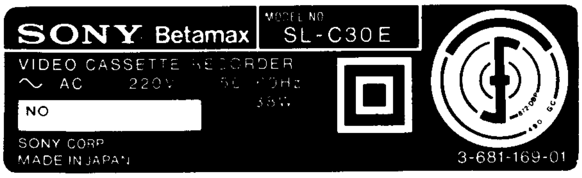
This machine is designed to record and playback using the PAL colour standard. Recording and playback of video sources based on other colour systems cannot be guaranteed.

If you have any questions about this unit, contact your Sony dealer.

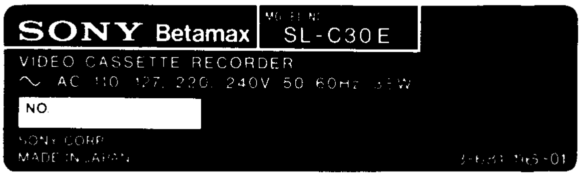
## MODEL IDENTIFICATION

**— Specification Label —**

**SL-C30E AEP MODEL**



**SL-C30E E MODEL**



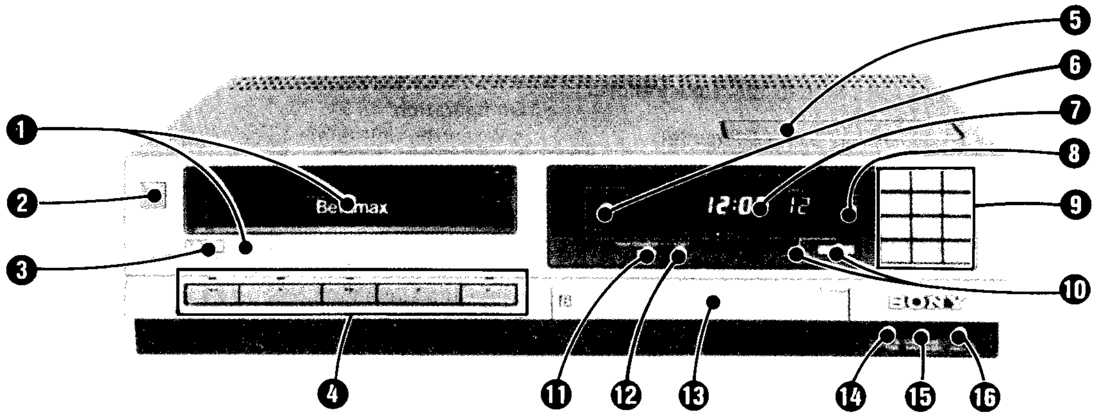
# SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

## 1-2. LOCATION AND FUNCTION OF CONTROLS

### Front



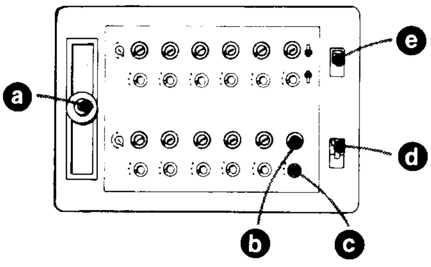
**❶ Cassette compartment and CASSETTE INSIDE lamp**
Insert a cassette after turning on the recorder. The lamp lights up when a cassette is inside.

**❷ ON/STANDBY button and lamp**
Press to turn on the unit. The lamp will light up. Press again to turn it off.
The timer section will continue to operate and the time will be displayed even if the ON/STANDBY button is off so long as the ac power cord is connected to the wall outlet.

**❸ EJECT button**
Press to remove the cassette. This button does not function when the recorder is turned off.

**❹ Function buttons**
▶ PLAY button : Press to play the tape back.
◀◀ REW button : Press to rewind the tape. Also used for the reverse picture search and skip scan operation.
▶▶ FF button : Press to advance the tape rapidly. Also used for the forward picture search and skip scan operation.
■ STOP button : Press to stop the tape.
❚❚ PAUSE button : Press to stop the tape for a moment during recording or playback. A still picture will be seen during playback. Press again to release the pause mode.

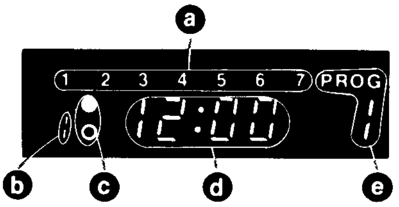
**❺ Tuning compartment**



- **ⓐ Tuning aid** : Use to select the band and to turn the tuning control. The indication at its end shows the approximate position within the selected band.
- **ⓑ Tuning control** : With the supplied tuning aid, turn until the desired station is properly tuned in.
- **ⓒ Band-select switch** : Using the supplied tuning aid, set to $V_L$ (channels E2 through E4), $V_H$ (channels E5 through E12), or U (channels E21 through E68) according to the channel to be tuned in.
- **ⓓ AFT switch** : When the tuning compartment is closed, the automatic fine tuning circuit locks in the signal and maintains a sharp picture.
- **ⓔ TEST SIGNAL switch** : Set to ON to obtain a test pattern.

**❻ REMOTE SENSOR**
Detects the remote control signal transmitted from the supplied remote control unit.

**❼ Display window**



- **ⓐ Day of the week indication** : Shows the day of the week on which the timer-activated recording will take place.
- **ⓑ Event number**
- **ⓒ Turn-on and turn-off setting indications** : The "●" mark shows you are setting the turn-on time and the "O" mark shows the turn-off time.
- **ⓓ Time and counter display** : Usually shows the present time. When the TIMER/COUNTER button is pressed to COUNTER, the display shows the counter number.
- **ⓔ Programme number** : Shows the programme number selected with the programme select buttons. When the INPUT SELECT switch is set to LINE to record signals from the VIDEO IN and AUDIO IN jacks, the indication will change to "AU".

**⑧ TIMER REC lamp**
Lights when the TIMER REC button behind the front panel is pressed to set the recorder in the stand-by mode. It remains lit till the timer recording is finished.

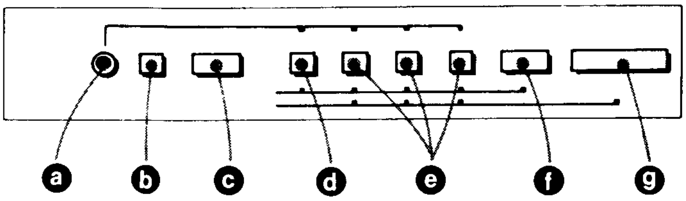
**⑨ Programme select buttons**
Select the number of the programme to be recorded or to be viewed. The selected programme number will appear in the display window.

**⑩ RECORD button and lamp**
Press to start recording. The lamp will light up.

**⑪ TIMER/COUNTER button**
Press to set the display to the tape counter. To reset to clock, press it again.

**⑫ COUNTER RESET button**
Press to set the tape counter reading to "0000".

**⑬ Timer setting section (behind the front panel)**



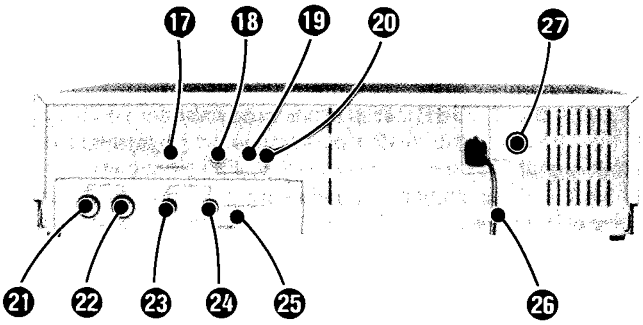
- ⓐ **CLOCK SET button:** Press to set the clock.
- ⓑ **CLEAR button:** Press to clear the timer programme memorized.
- ⓒ **TIMER SET button:** Press to set the turn-on/off time of a recording.
- ⓓ **DAY button:** Press to set the turn-on day of a recording.
- ⓔ **HOUR, 10 MIN and MIN buttons:** Press to set the turn-on/off time of a recording.
- ⓕ **PROG button:** Press to select the TV programme to be recorded by the timer.
- ⓖ **TIMER REC button:** Press to set the recorder in the timer recording stand-by mode.

**⑭ TONE select switch**
Normally set to the H position. Set to L if the sound seems to exaggerate high frequencies during the playback of a tape recorded on another recorder.

**⑮ INPUT SELECT switch**
Select the programme to be recorded.
LINE: for recording signals connected to the VIDEO IN and AUDIO IN jacks
TUNER: for recording TV programmes

**⑯ TRACKING control**
If streaks or snow appears during the playback of a tape recorded on another recorder, turn this knob to obtain the best possible picture.

**Rear**



**⑰ RF CHANNEL screw**
If there is interference on the factory preset channel for RF output and the signal of this recorder unit cannot be displayed clearly on the TV screen, adjust this screw with the supplied screwdriver.

**⑱ AERIAL OUT socket**
Connect the aerial input of the TV receiver using the supplied cable.

**⑲ DX/LOCAL switch**
Normally set this switch to DX. If the TV signal is very strong, set the switch to LOCAL.

**⑳ AERIAL IN socket**
Connect the aerial cable.

**㉑ VIDEO OUT jack (BNC type)**
Connect to the video input of another video cassette recorder or a video monitor.

**㉒ VIDEO IN jack (BNC type)**
Connect to the video output of a camera, another video cassette recorder, etc.

**㉓ AUDIO OUT jack (phono type)**
Connect to the audio input of a video monitor or a video cassette recorder.

**㉔ AUDIO IN jack (phono type)**
Connect to the audio output of a camera or another video cassette recorder.

**㉕ CAMERA REMOTE jack (special mini jack)**
For camera recording, connect an ac adaptor to this jack.

**㉖ AC mains lead**

**㉗ Voltage Selector (E model only)**

## 1-3. ADJUSTING THE TV

One of the television channels must be adjusted to receive the signal from the recorder.

1 After making the connections, press the ON/STANDBY button.
2 Make sure that the recorder is in the stop mode.
3 Set the TEST SIGNAL switch in the tuning compartment of the recorder to ON.
4 Turn on the TV and select a channel which is not being used to receive a TV station. Tune the channel until you see a clear black and white pattern on the TV screen and you hear a continuous tone. This is the recorder's test signal.
● Note that the test signal is transmitted on a channel between UHF channels 30 and 39.

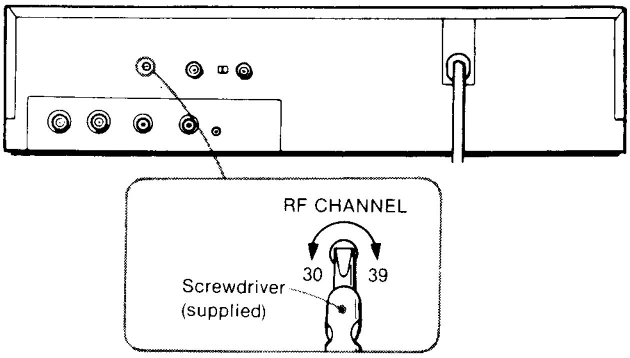
**If the test picture is free of disturbance,** the TV adjustment is complete. Set the TEST SIGNAL switch to OFF.
**If the test picture is not free of disturbance,** proceed with the next adjustment.

> Whenever you use the video recorder, you should set the TV to the channel selected in this adjustment.

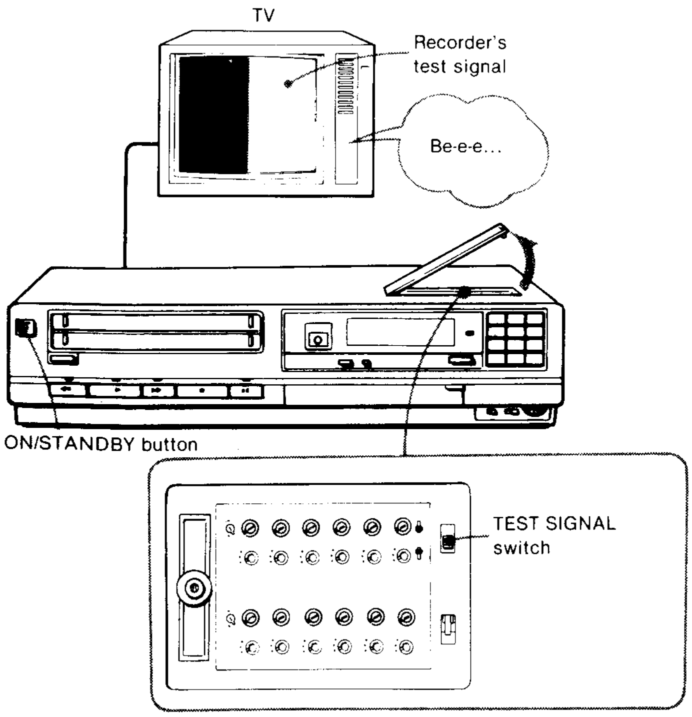
—If you are not sure how to adjust your TV, please refer to the TV's instruction manual or consult your dealer.

**If the test picture is not free of disturbance**

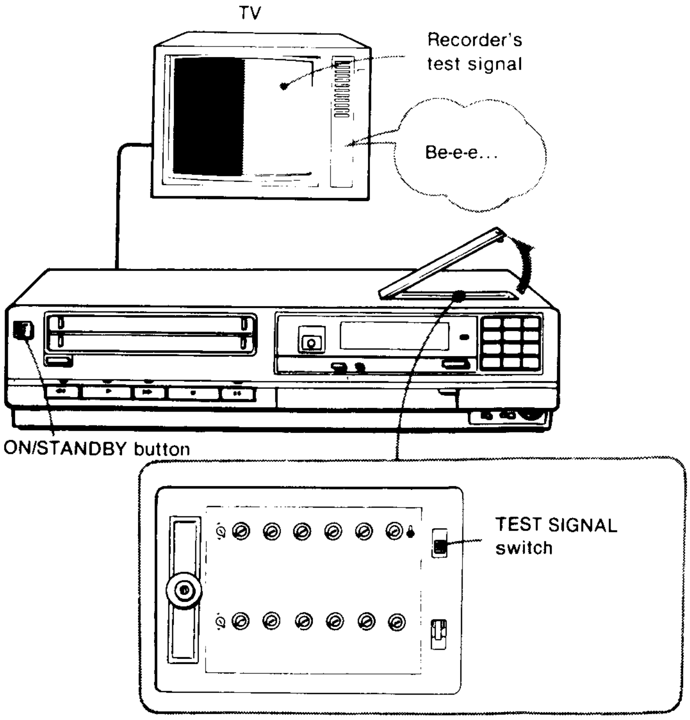
1 Reset the TEST SIGNAL switch to OFF.
2 Adjust the channel of the TV to a channel between UHF channels 30 and 39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.
3 Set the TEST SIGNAL switch to ON again.
4 Slowly turn the RF CHANNEL screw on the back of the recorder with the supplied screwdriver, until you see an undistorted test picture on the TV screen.
5 Now the TV adjustment is complete. Reset the TEST SIGNAL switch to OFF.



**(AEP. E MODEL)**



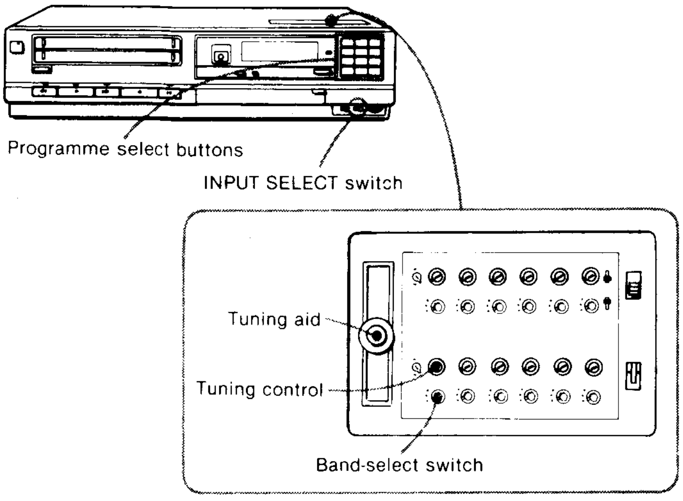
**(UK MODEL)**



## 1-4. TV STATION PRESETTING

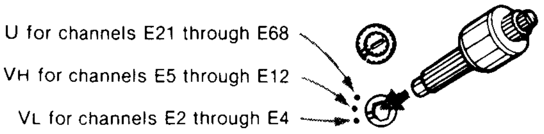
### (AEP. E MODEL)

Once you have tuned your TV to the recorder, the next step is to tune the recorder to all the TV stations that you can receive in your area. Up to 12 TV stations can be preset in any order.

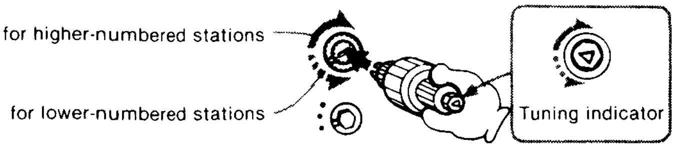

Programme select buttons
INPUT SELECT switch
Tuning aid
Tuning control
Band-select switch

**PRESETTING PROCEDURE**

1. Set the INPUT SELECT switch to TUNER.
2. Press the programme-select button to be preset.
3. Open the tuning compartment and, using the supplied tuning aid, set the band-select switch corresponding to the selected programme number to one of the three positions :


U for channels E21 through E68
VH for channels E5 through E12
VL for channels E2 through E4

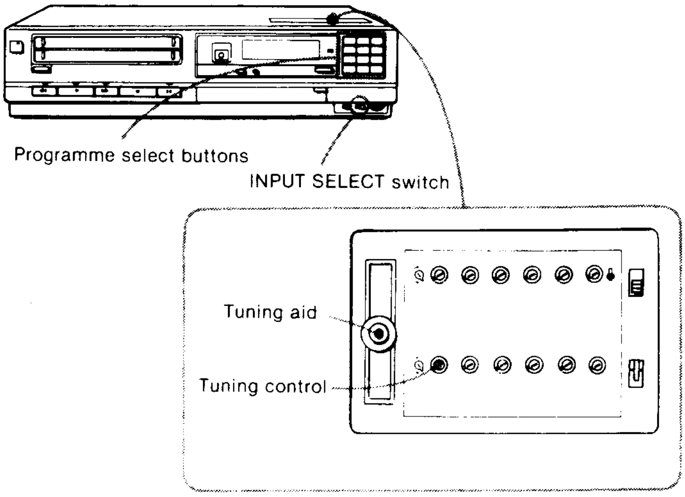
4. Using the other side of the tuning aid, turn the tuning control until the desired station is properly tuned in.
   The indicator on the top of the tuning aid shows the approximate position in the selected band.


for higher-numbered stations
for lower-numbered stations
Tuning indicator

If you keep turning the tuning control clockwise, you will again get to the lowest-numbered station within that band.

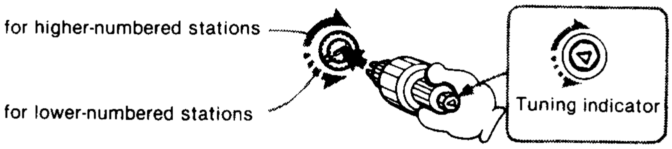
### (UK MODEL)

Once you have tuned your TV to the recorder, the next step is to tune the recorder to all the TV stations that you can receive in your area. Up to 12 TV stations can be preset in any order.


Programme select buttons
INPUT SELECT switch
Tuning aid
Tuning control

**PRESETTING PROCEDURE**

1. Set the INPUT SELECT switch to TUNER.
2. Open the tuning compartment.
3. Press the programme-select button to be preset.
4. Using the tuning aid, turn the tuning control until the desired station is properly tuned in.
   The indicator on the top of the tuning aid shows the approximate position.


for higher-numbered stations
for lower-numbered stations
Tuning indicator

If you keep turning the tuning control clockwise, you will again get to the lowest-numbered station.

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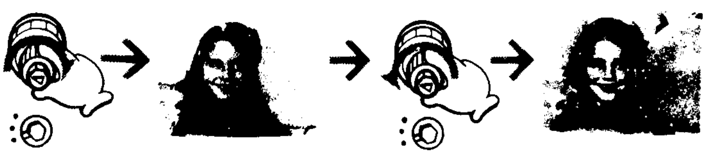
When the picture appears, slowly turn the tuning control to the right until a herringbone pattern appears in the coloured part of the picture, then turn the control back until the picture is perfectly clear.

To identify the stations, consult a newspaper or TV programme guide.



5. Repeat steps **3** and **4** for all the other stations. (UK MODEL)
5. Repeat steps 2, 3 and 4 for all the other stations. (AEP. E MODEL)
6. Close the tuning compartment.
   AFT (automatic fine tuning) circuit then locks in the signal and maintains a sharp picture.

After presetting the TV stations, you can use the programme select buttons of the recorder to tune in a station for viewing as well as recording.

## 1-5. CLOCK SETTING

When you connect the mains lead to a wall outlet, the clock indicates "0:00" with the two dots blinking.

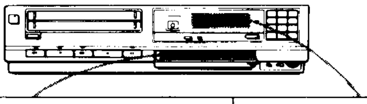
Example : To set the clock to 7 : 35 p.m. (19 : 35) on Tuesday*

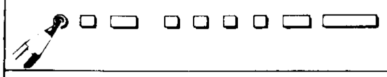
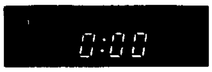
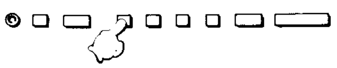
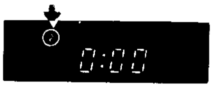
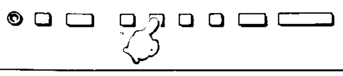
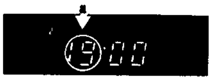
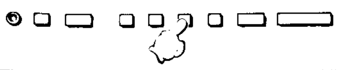
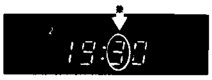
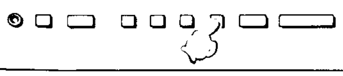
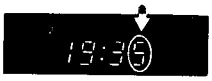
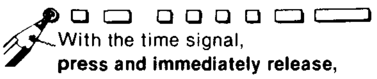
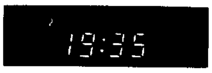
*** Time indication**

| AM | | | | PM | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 12:00<br>(midnight) | 1:00 | | 11:00 | 12:00<br>(noon) | 1:00 | 2:00 | | 10:00 | 11:00 |
| ↓<br>0:00 | ↓<br>1:00 | ····· | ↓<br>11:00 | ↓<br>12:00 | ↓<br>13:00 | ↓<br>14:00 | ····· | ↓<br>22:00 | ↓<br>23:00 |

**Day indication**

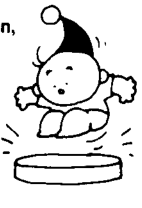
| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|
| ↓<br>1 | ↓<br>2 | ↓<br>3 | ↓<br>4 | ↓<br>5 | ↓<br>6 | ↓<br>7 |



| | |
|---|---|
| **1** CLOCK SET<br>SET/START<br> |  |
| **2** DAY<br> |  |
| **3** HOUR<br> |  |
| **4** 10 MIN<br> |  |
| **5** MIN<br> |  |
| **6** CLOCK SET<br>SET/START<br><br>With the time signal,<br>**press and immediately release, otherwise the clock will not start operating.**<br>If you press the CLOCK SET button for more than a second, clock adjustment will be required again. | <br>The upper dot blinks for the first half of each minute, and the lower dot for the second half. |

The DAY, HOUR, 10 MIN and MIN buttons can be pressed in two ways :

**When you hold a button down,** the digits will advance continuously until the button is released.



**When you press and immediately release a button,** the digits will advance by one.

**Zero second adjustment**
Press the CLOCK SET button quickly (less than a second).
While the upper dot is blinking, the clock is set to the time displayed 00 second. For example, if the clock time is 7 : 30, 20 seconds, it is set to 7 : 30, 00 second.
While the lower dot is blinking, the clock advances one minute and is set to the time displayed 00 second. For example, if the clock time is 7 : 30, 40 seconds, it is set to 7 : 31, 00 second.

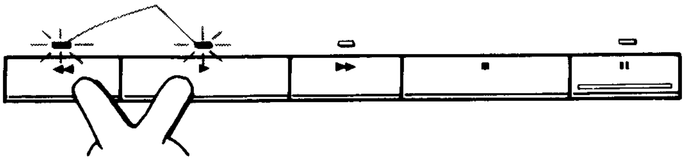
If you press the CLOCK SET button for more than a second, "0 : 00" blinks to show that the clock adjustment is required again.

**When power has been interrupted for more than 3 minutes,** the time indication "0 : 00" blinks, showing that the clock must be reset.
If power has been interrupted for less than 3 minutes, the displayed time remains correct.

## 1-6. AUTO PLAY

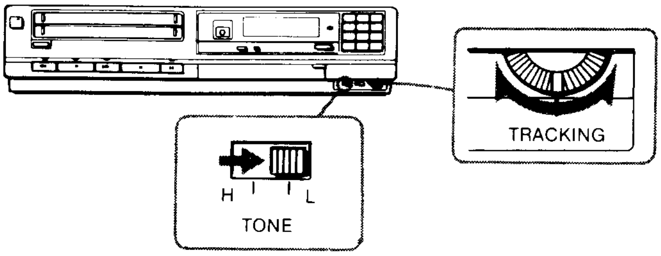
**To playback from the beginning of the tape after rewinding**

Press the ▶ PLAY button and ◀◀ REW button simultaneously in the stop mode. The lamps above these buttons blink alternately during rewinding.
After the tape is completely rewound, it will be automatically played back.



**When playing back a tape recorded on another machine**

**If streaks or snow appears,** adjust the TRACKING control for the best possible picture.
Return the control to the centre position after playing back the tape.

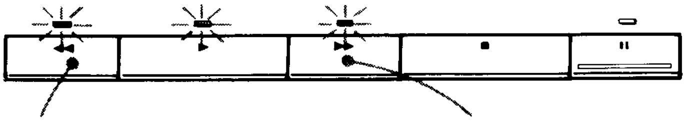


**If the playback sound seems to have exaggerated high frequencies,** set the TONE selector to L. Return the selector to the normal H position after playing back the tape.

## 1-7. TO SEARCH FOR A PARTICULAR SCENE

**Picture search**

**During playback**



Keep ◀◀ pressed for high-speed reverse picture.

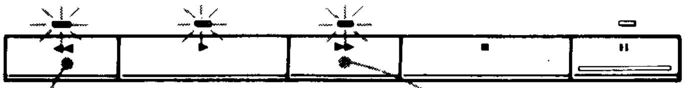
Keep ▶▶ pressed for high-speed forward picture.

Release the button at the desired point.
Normal playback will resume.

The picture search mode can also be started directly from the pause mode.

**Skip Scan**

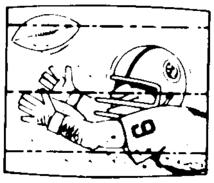
**During rewind or fast forward mode**



When rewinding the tape, keep ◀◀ pressed for high-speed reverse picture.

When rapidly advancing the tape, keep ▶▶ pressed for high-speed forward picture.

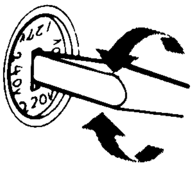
Release the button at the desired point.
The normal rewind or fast forward mode will resume.



Streaks will appear during the picture search, the skip scan and the pause modes.

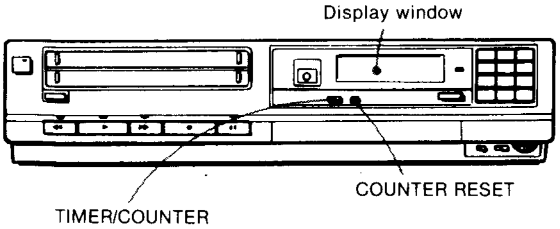
## OPERATING VOLTAGE

Before connecting the set to a power source, check that the voltage selector located at the rear is set to your local mains power voltage. The operating voltage can be set to 110 V, 127 V, 220 V or 240 V ac. If the selector must be reset, turn the selector with a screwdriver or similar object so that the triangle points to the appropriate voltage.
**(E model only)**

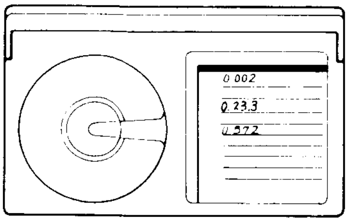


## 1-8. USE OF THE TAPE COUNTER

Turn on the power and press the TIMER/COUNTER button to display the counter reading in the display window.
To return the display to the present time, press the TIMER/COUNTER button again.



Before starting recording or playback, press the COUNTER RESET button to set the counter to "0000".
By noting the counter reading at the desired point, you can easily find that point later by referring to the counter.



Write the counter readings you want to remember on the label of the cassette.

Normal rewinding will stop at the tape counter's "0000" position.
To rewind the tape further, press the ◀◀ button again.
With automatic rewinding from the tape end or for "auto play", the tape will not stop at the counter's "0000" position.

**Notes**

- ●The counter reading is automatically reset to zero when a cassette is newly inserted.
- ●While the power is off, the display shows the present time, regardless of the TIMER/COUNTER setting.
- ●The counter reading will be retained in the memory even after the power is turned off, as long as the cassette is in the cassette compartment.
- ●The tape counter does not operate when a blank, unrecorded tape is played.

## 1-9. TIMER-ACTIVATED RECORDING

You can make one or two recordings within 7 days even when you are not at home. These recordings are identified as event 1 or event 2.

**Check before setting the timer**

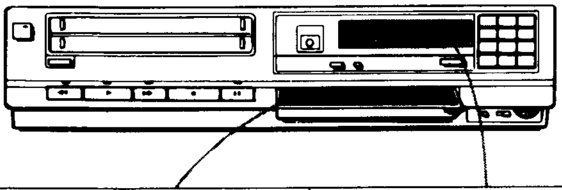
- Is the clock set to the correct day and correct time?

Timer setting can only be made after the clock has been set.

- Is a cassette inserted in the recorder?
- Is the cassette long enough to record the programmes?
- Does the cassette have a safety tab on the bottom?
- Is the INPUT SELECT switch set to TUNER?

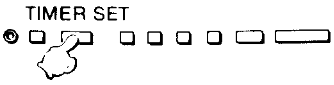
**Note:** The timer cannot be set during recording, playback, or when the INPUT SELECT switch is set to LINE (The "AU" appears on the display window.).

**Example:** To record a PROG 2 broadcast from 9 : 00 AM to 11 : 25 AM on Friday for event 1.



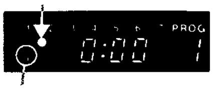
| | Button to be pressed. | Time display |
|---|---|---|
| 1 | | The segment to be set will blink. |

**1**



If the recorder is off, it will be turned on automatically.

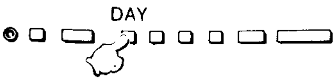
Turn-on indication

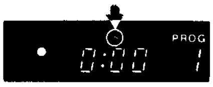


Shows the event number.

If event 1 is already reserved for another programme, event 2 will be displayed here.

**2** Select the turn-on day.

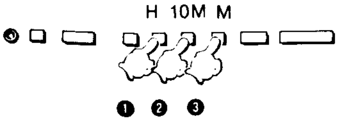


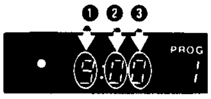


Indication changes as follows :

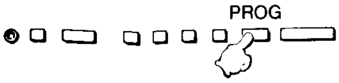
1234567 (everyday) → 1 (Monday) → 2 (Tuesday)... → 7 (Sunday)

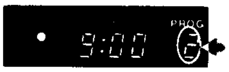
**3** Set the turn-on time.



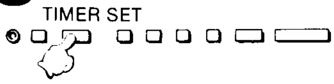


**4** Select the programme to be recorded.

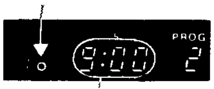




**5**

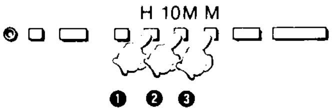


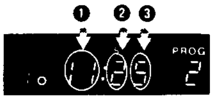
Turn-off indication



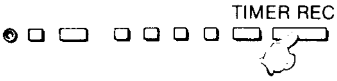
Blinks.

**6** Set the turn-off time.

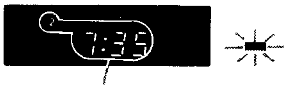




**7**



TIMER REC



Present day and time

TIMER REC lamp lights up and the power is turned off.
At the preset turn-on time, recording will start automatically and will stop at the preset turn-off time.

If the inserted cassette is at its end or does not have the safety tab, the cassette will be automatically ejected.

ONCE THE TIMER REC LAMP HAS LIT UP, NO FUNCTION OF THE RECORDER CAN BE ACTIVATED, except for checking the timer setting.
To operate the recorder after setting the timer for recording, press the TIMER REC button so that the TIMER REC lamp goes off. To reactivate the timer recording standby mode, be sure to press the TIMER REC button again.

**To record to the end of the tape**

Set the turn-off time to a time after the tape will reach its end.

**If the tape reaches the end during the timer recording**

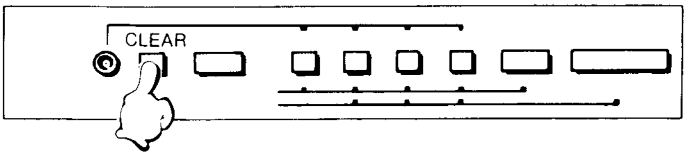
The recording will stop and the tape will be rewound to the beginning. Then after about a second, the recorder will be turned off.

**To stop the on-going timer recording**

Press the TIMER REC button so that the TIMER REC lamp goes off. The unit will be turned off automatically after about a second.

**To erase the setting of an event**

1. Press the TIMER SET button to display the event to be erased.
2. Press the CLEAR button. This event will be erased from the memory.



**When a power interruption occurs**

**If the clock shows "0 : 00" and the dots blink**
All the timer settings have been erased. Reset the clock time and the timer settings.

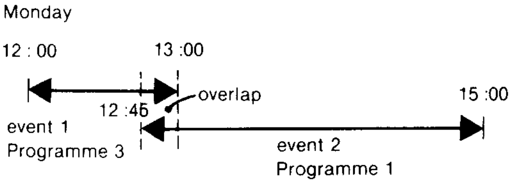
**If the clock still shows the correct time but the dots blink**
The power has been interrupted for less than 3 minutes.
The timer programmes are retained in the memory and the on-going timer recording will resume when the power is resupplied.
To stop the blinking, press any button in the timer-setting compartment.

## ERROR INDICATIONS

**If the ● and ○ indications as well as the event numbers blink when the TIMER REC button is pressed...**
It means that the setting of these events overlap. Check the settings and eliminate the overlap.

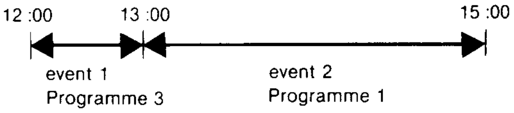
**Example :**

Timer setting



Even with this error indication, recording can be made.
In this case, the first preset recording continues to its turn-off point and then the next recording begins.

Realized recording



If the turn-on time of the 2 events is the same, recording of event 1 will be made.

## TO CHECK THE TIMER SETTING

Press the TIMER SET button. Each time you press the button, the indication will change as follows :

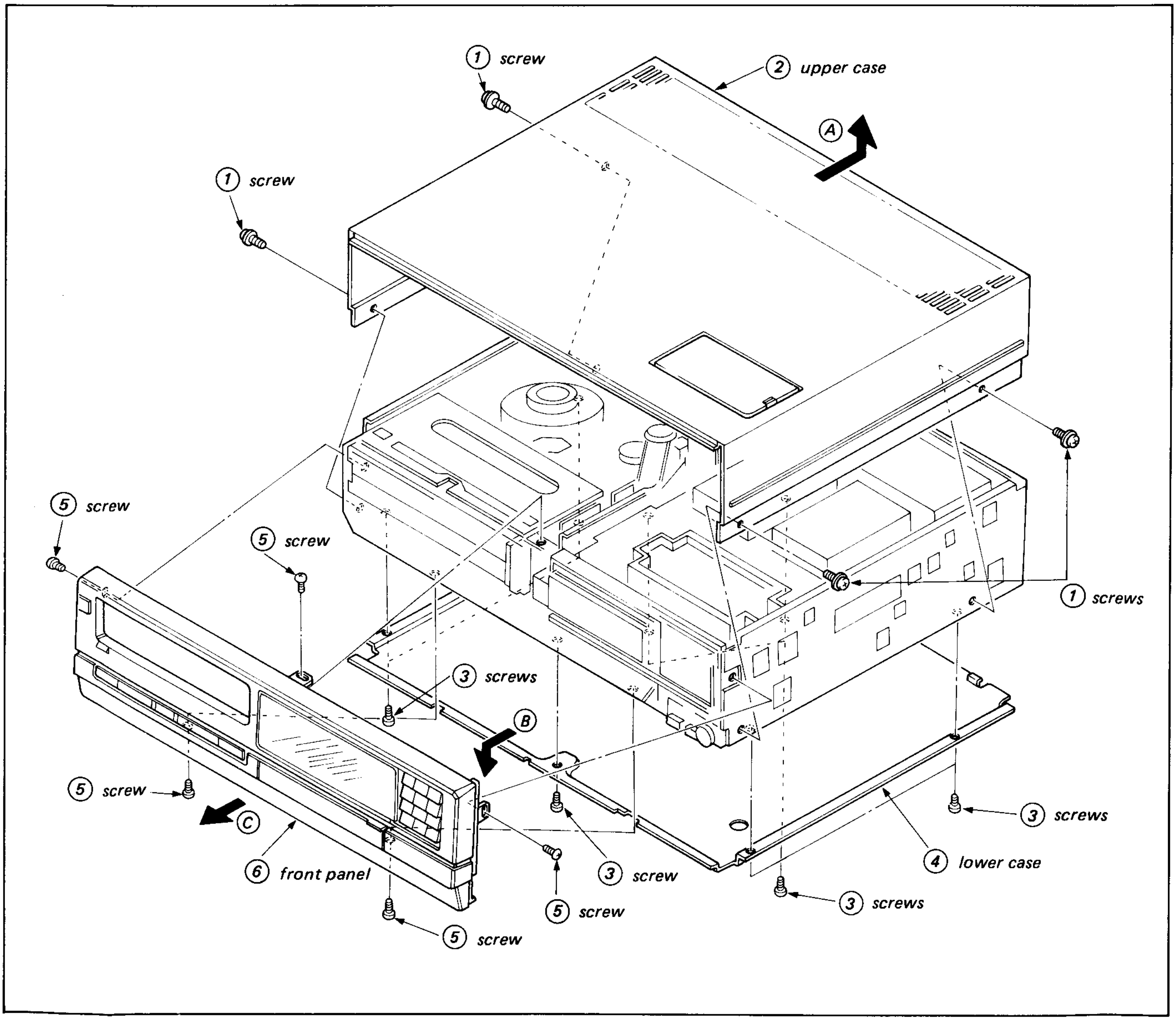
**Example :** Both event 1 and 2 have been programmed.
Turn-on day and time of event 1 → Turn-off day and time →
Turn-on day and time of event 2 → Turn-off day and time →
Present time

During actual timer recording, only the turn-off time of the event being recorded can be checked.

# SECTION 2
# DISASSEMBLY

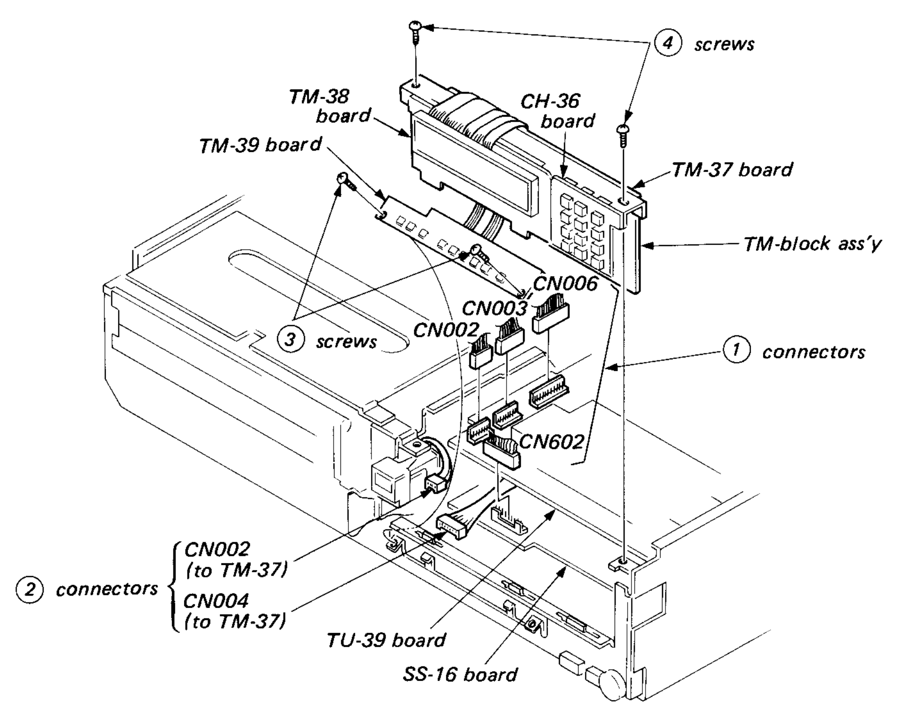
## 2-1. REMOVAL OF THE CASE AND FRONT PANEL

1) Remove the four screws ①.
2) Remove the upper case ② in the direction shown by the arrow Ⓐ.
3) Remove the seven screws ③ and the lower case ④ in the direction shown by the arrow Ⓑ.
4) Remove the five screws ⑤ and the front panel ⑥ in the direction shown by the arrow Ⓒ.


① screw
② upper case
Ⓐ
① screw
⑤ screw
⑤ screw
① screws
③ screws
Ⓑ
⑤ screw
Ⓒ
⑥ front panel
③ screw
⑤ screw
③ screws
④ lower case
③ screws
⑤ screw

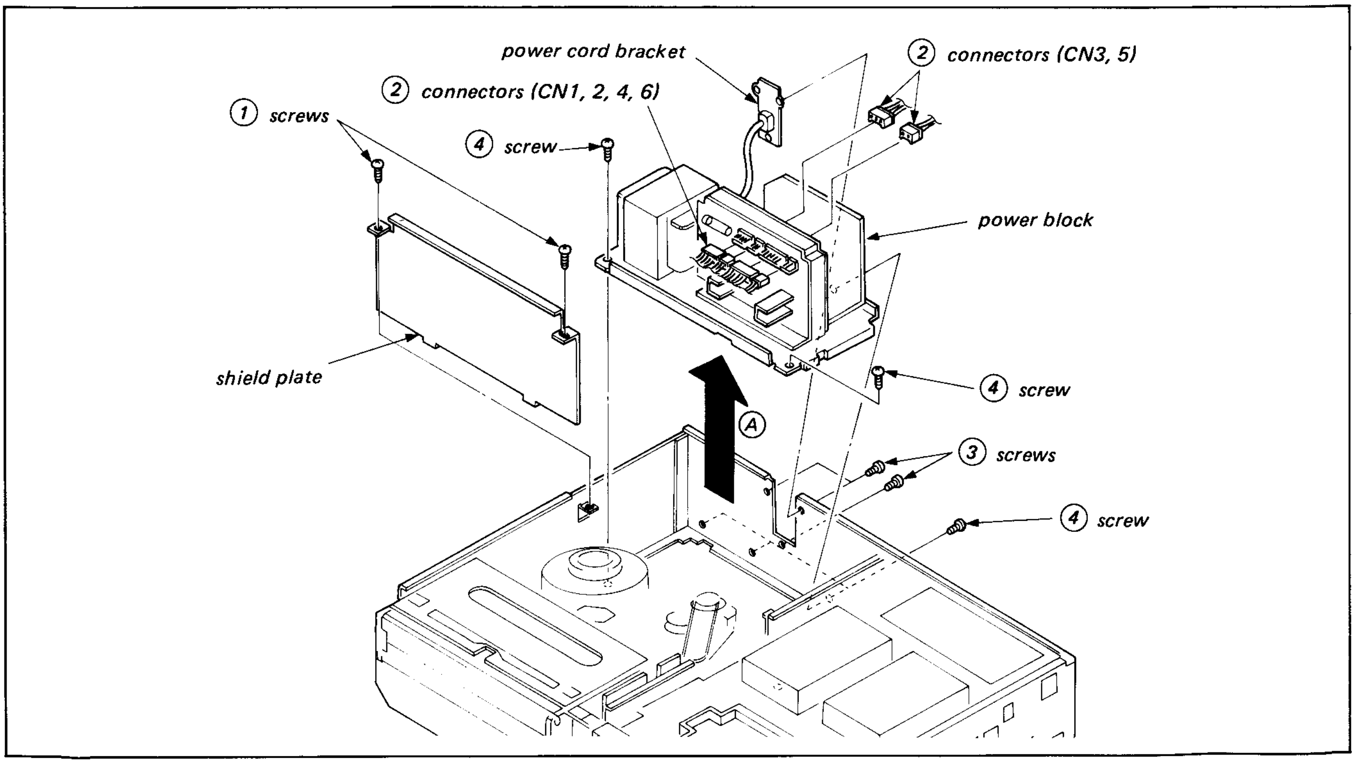
## 2-2. REMOVAL OF TM BLOCK ASS'Y

1) Pull out the four connectors ①.
2) Pull out the two connectors ②.
3) Remove two screws ③ and the TM-39 board.
4) Remove two screws ④ and the TM-block Ass'y.


④ screws
TM-38 board
CH-36 board
TM-39 board
TM-37 board
TM-block ass'y
CN006
CN003
③ screws
CN002
① connectors
CN602
② connectors
CN002 (to TM-37)
CN004 (to TM-37)
TU-39 board
SS-16 board

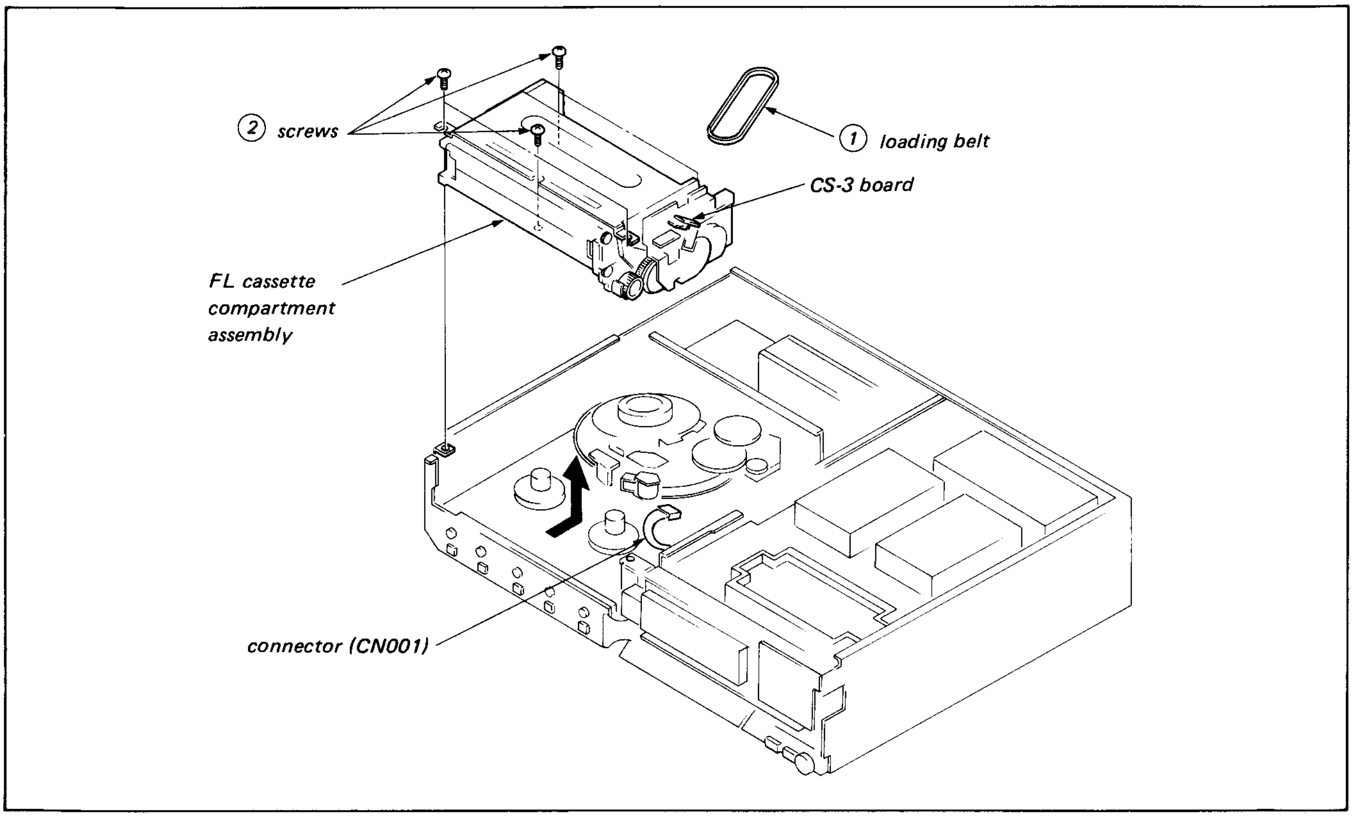
## 2-3. REMOVAL OF POWER BLOCK

1) Remove the two screws ①, and the shield plate.
2) Pull out the six connectors ②, (CN1, 2, 3, 4, 5, 6) from the power block side.
3) Remove the three screws ③ and the power cord bracket.
4) Remove the five screws ④, holding the power block.
5) Remove the power block in the direction shown by the arrow Ⓐ.


power cord bracket
② connectors (CN3, 5)
② connectors (CN1, 2, 4, 6)
① screws
④ screw
power block
shield plate
④ screw
Ⓐ
③ screws
④ screw

## 2-4. REMOVAL OF FL CASSETTE COMPARTMENT ASSEMBLY

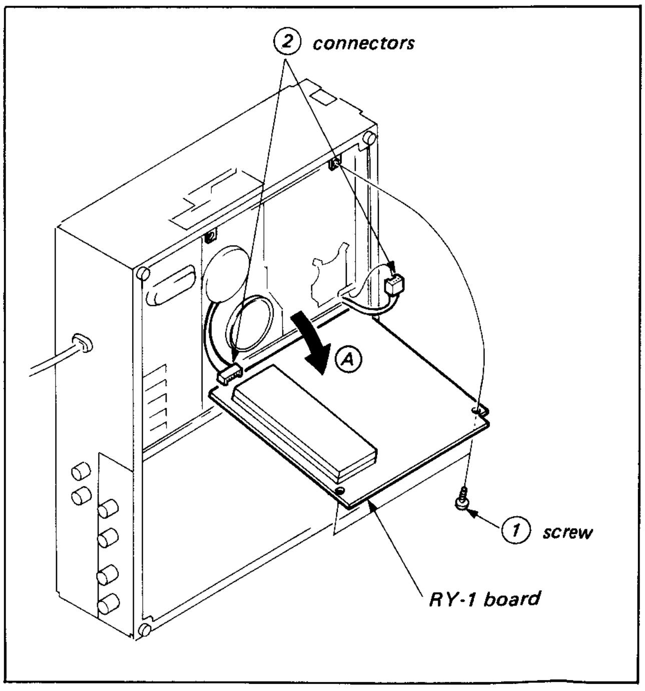
1) Loosen the loading belt ① exerting a force on the threading motor.
2) Remove the five mounting screws ② of the FL cassette compartment.
3) Disconnect the exposed connector from the CS-3 board (CN001) on the FL cassette compartment.
4) Lift the FL cassette compartment assembly in the direction shown by the arrow to remove.


② screws
① loading belt
CS-3 board
FL cassette compartment assembly
connector (CN001)

## 2-5. REMOVAL OF MECHANICAL CHASSIS BLOCK

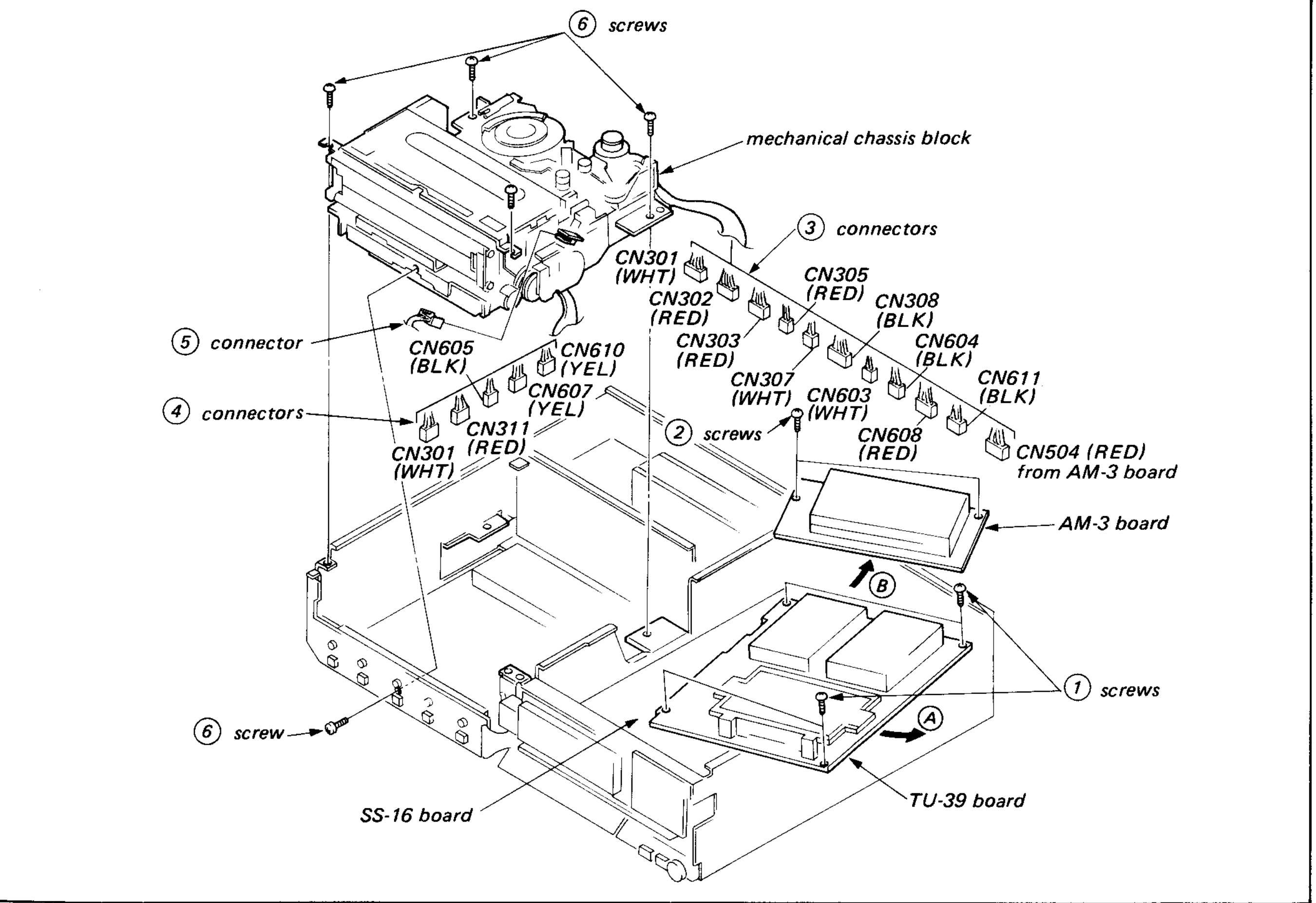
**(1)**

1) Stand the set with its power supply section down.
2) Remove the two screws ①, holding the RY-1 board.
3) Pull out the two connectors ②.
4) Remove the RY-1 board in the direction shown by the arrow Ⓐ.


② connectors
Ⓐ
① screw
RY-1 board

**(2)**

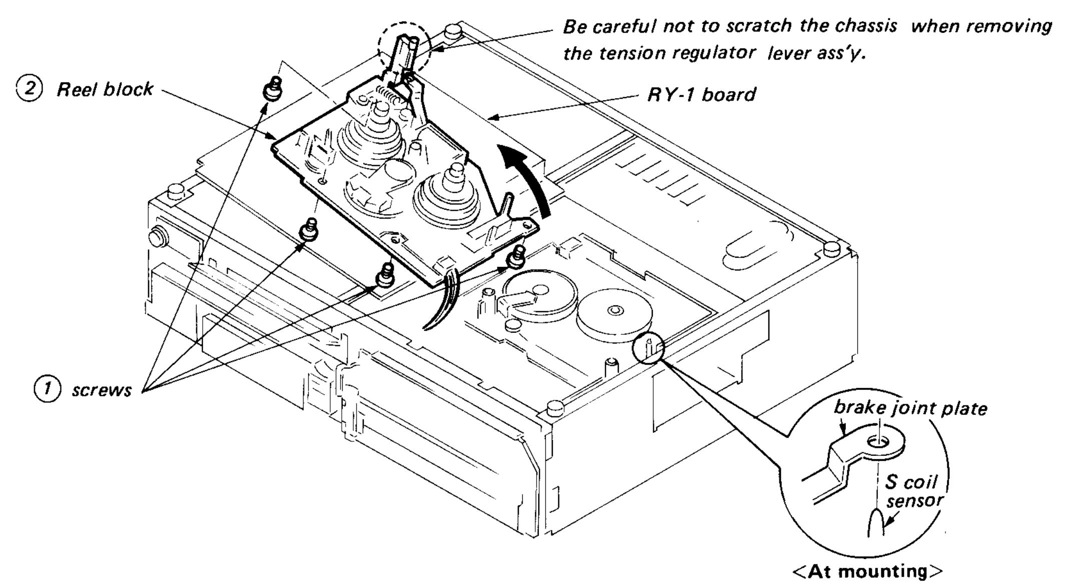
1) Remove the three screws ① and the TU-39 board in the direction shown by the arrow Ⓐ.
2) Remove the two screws ② and the AM-3 board in the direction shown by the arrow Ⓑ.
3) Pull out the ten connectors ③ from the SS-16 board and pull out the rest one from AM-3 board.
4) Pull out the five connectors ④ from the SS-16 board and pull out the connector ⑤.
5) Remove the five screws ⑥ and the mechanical chassis block.



⑥ screws
mechanical chassis block
③ connectors
CN301 (WHT)
CN302 (RED)
CN305 (RED)
CN308 (BLK)
CN303 (RED)
CN604 (BLK)
CN307 (WHT)
CN603 (WHT)
CN611 (BLK)
⑤ connector
CN605 (BLK)
CN610 (YEL)
CN607 (YEL)
④ connectors
CN311 (RED)
CN301 (WHT)
② screws
CN608 (RED)
CN504 (RED) from AM-3 board
AM-3 board
Ⓑ
① screws
Ⓐ
⑥ screw
SS-16 board
TU-39 board

## 2-6. REMOVAL OF REEL ASS'Y

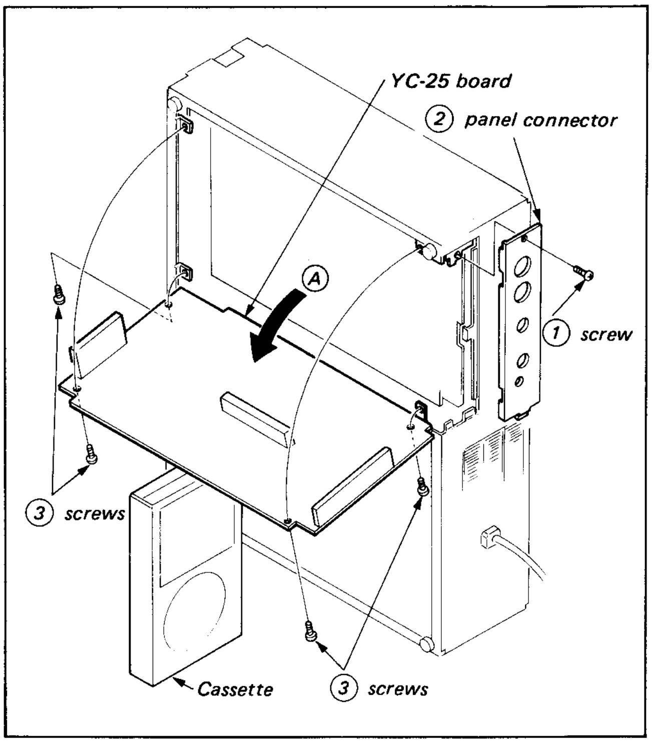
1) Remove four screws ①.
2) Remove the reel block ②.



Be careful not to scratch the chassis when removing the tension regulator lever ass'y.
② Reel block
RY-1 board
① screws
brake joint plate
S coil sensor
<At mounting>

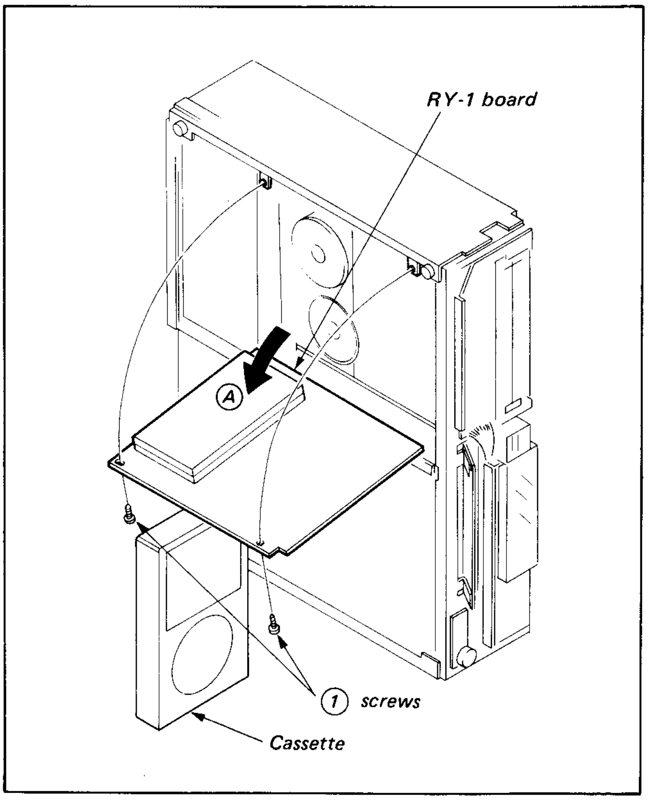
## 2-7. REMOVAL OF THE YC-25 BOARD

1) Stand the set with the power source side on the bottom.
2) Remove the screw ① and the panel connector ②.
3) Remove the four screws ③, holding the YC-25 board.
4) Swing open the YC-25 board in the direction shown by the arrow Ⓐ and rest it on a cassette.


YC-25 board
② panel connector
Ⓐ
① screw
③ screws
Cassette
③ screws

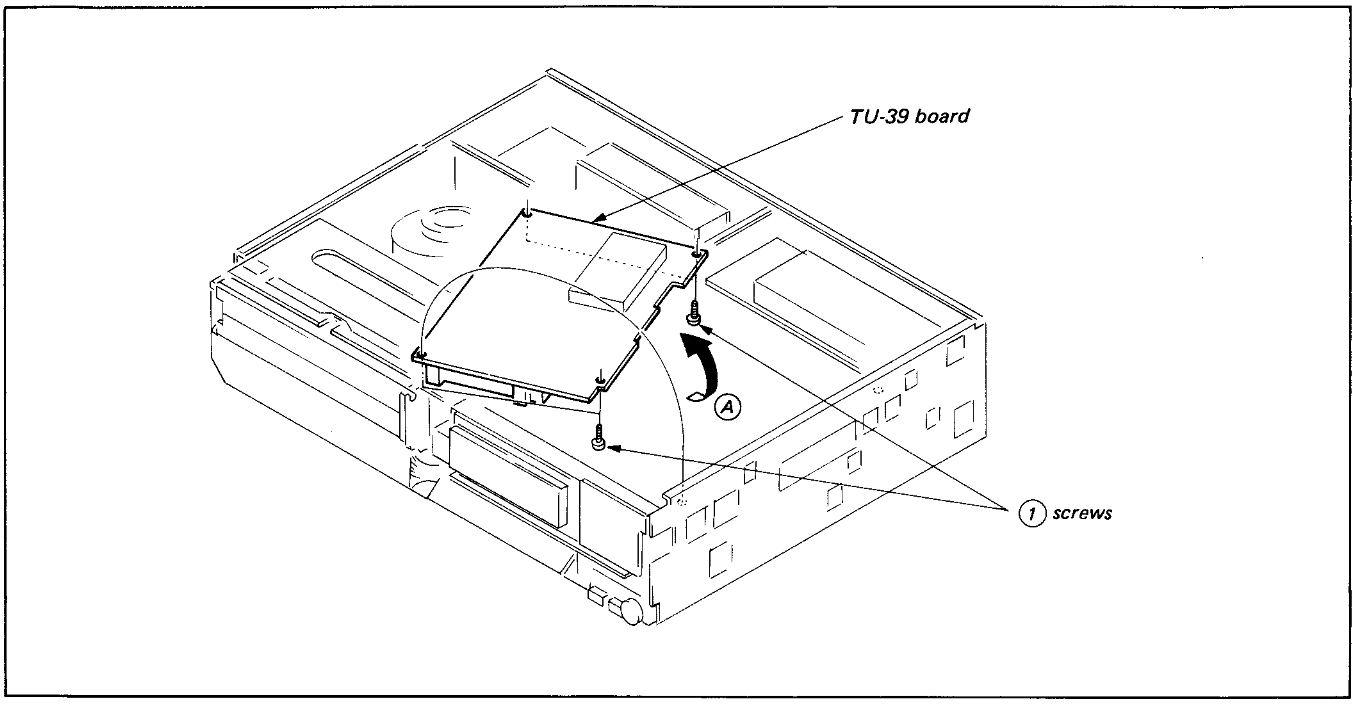
## 2-8. REMOVAL OF THE RY-1 BOARD

1) Stand the set with the right side panel on the bottom.
2) Remove the two screws ①, holding the RY-1 board.
3) Swing open the RY-1 board in the direction shown by the arrow Ⓐ and rest it on a cassette.


RY-1 board
Ⓐ
① screws
Cassette

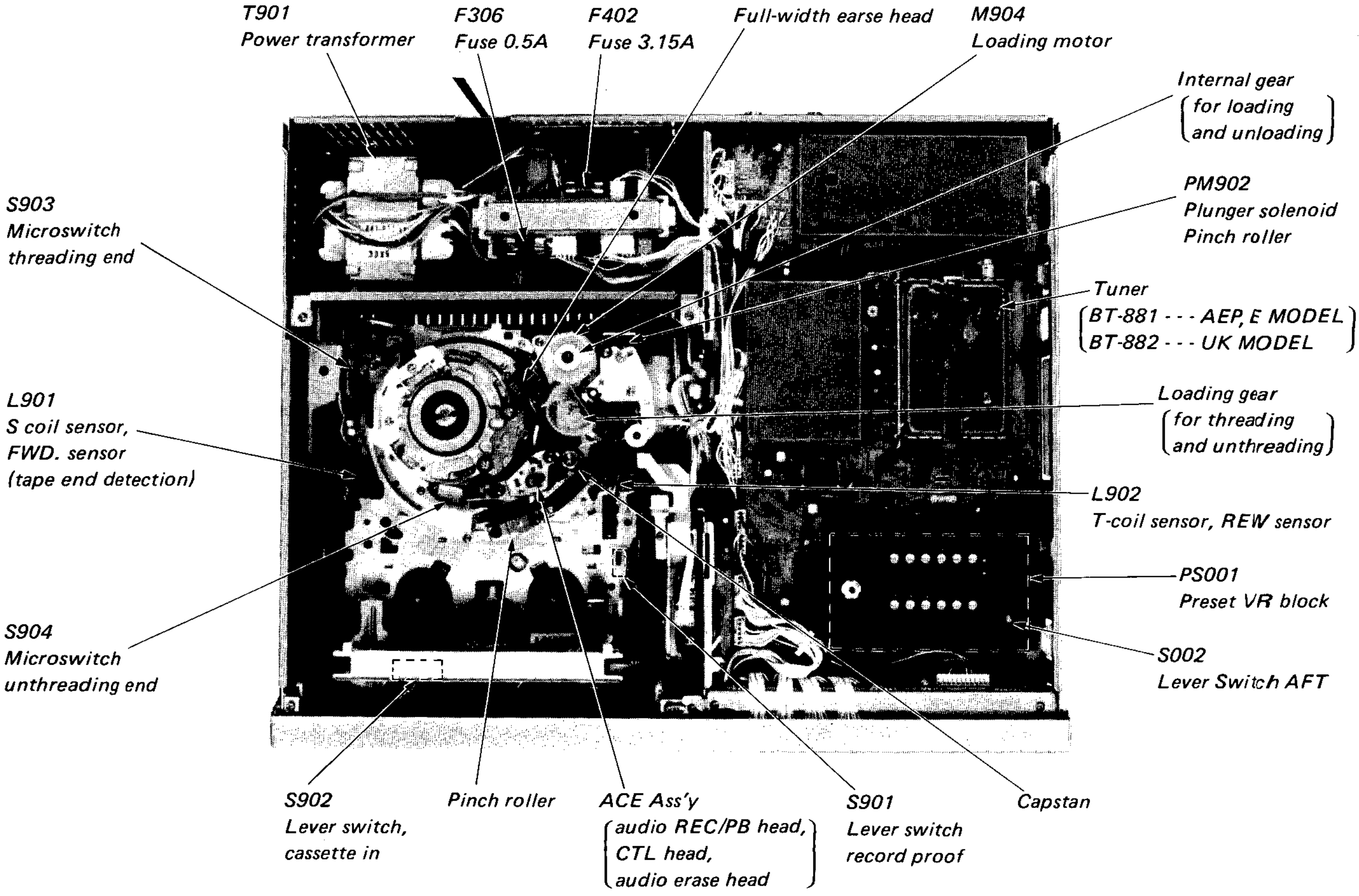
## 2-9. REMOVAL OF THE TU-39 BOARD

1) Place the set upside down.
2) Remove the four screws ① holding the TU-39 board.
3) Remove the TU-39 board in the direction shown by the arrow Ⓐ.

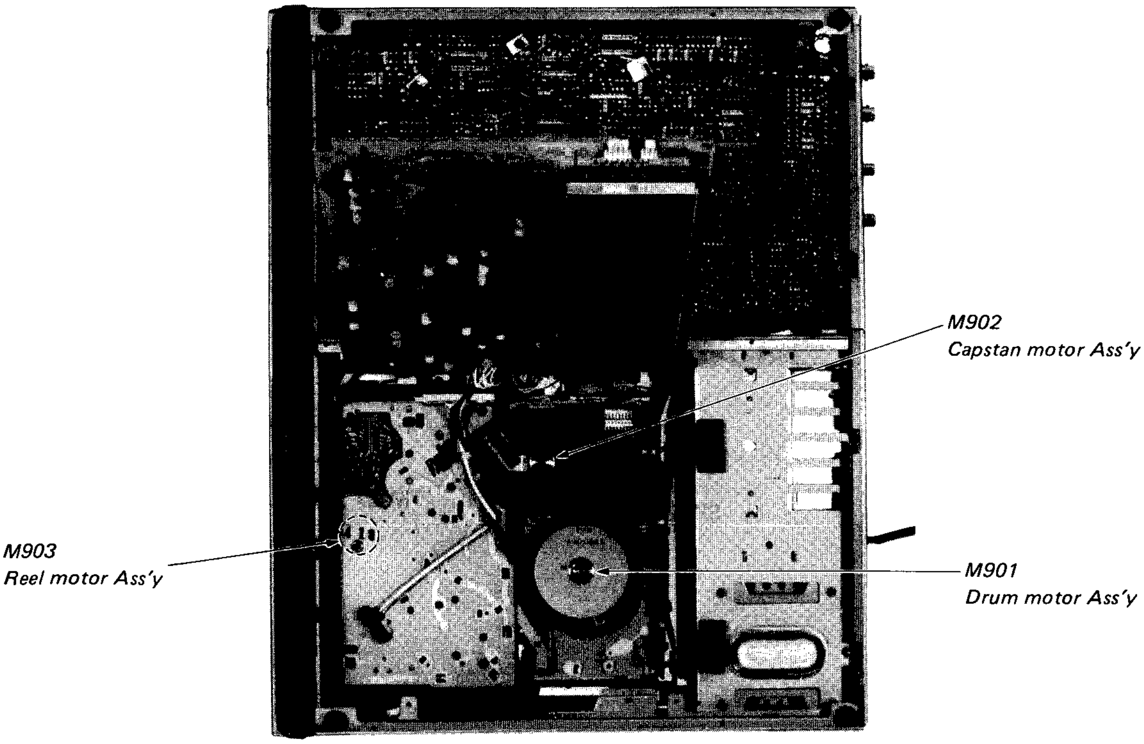

TU-39 board
Ⓐ
① screws

## 2-10. INTERNAL VIEWS

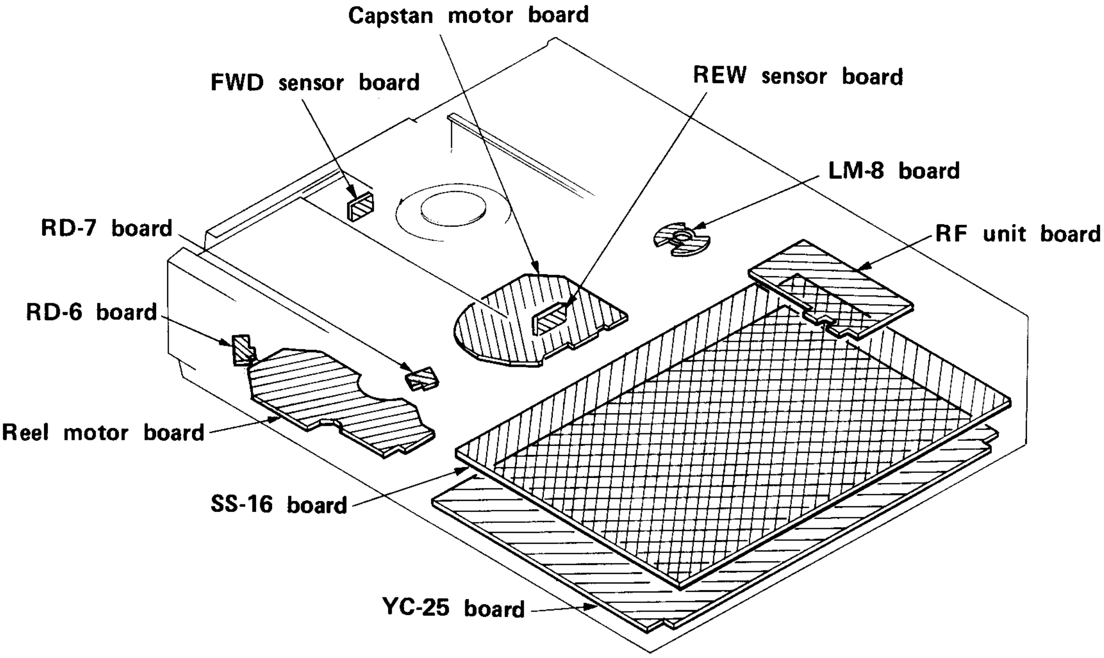
### – Top side –

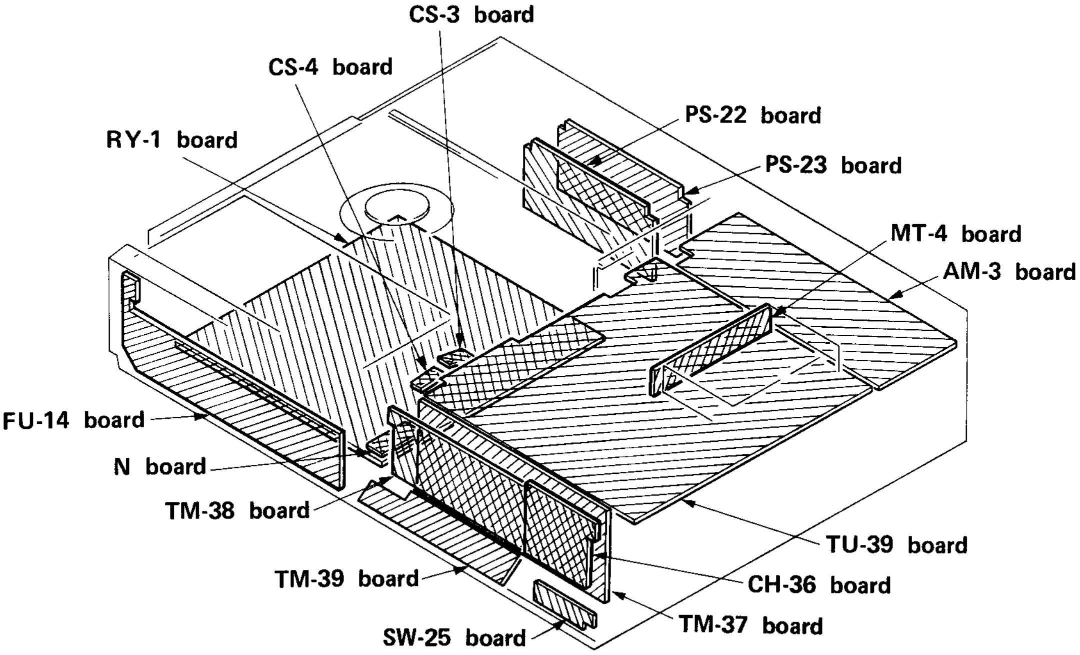

T901
Power transformer
F306
Fuse 0.5A
F402
Fuse 3.15A
Full-width earse head
M904
Loading motor
Internal gear (for loading and unloading)
PM902
Plunger solenoid
Pinch roller
Tuner (BT-881 - - - AEP, E MODEL BT-882 - - - UK MODEL)
Loading gear (for threading and unthreading)
L902
T-coil sensor, REW sensor
PS001
Preset VR block
S002
Lever Switch AFT
S903
Microswitch
threading end
L901
S coil sensor,
FWD. sensor
(tape end detection)
S904
Microswitch
unthreading end
S902
Lever switch,
cassette in
Pinch roller
ACE Ass'y (audio REC/PB head, CTL head, audio erase head)
S901
Lever switch
record proof
Capstan

### – Bottom side –


M902
Capstan motor Ass'y
M903
Reel motor Ass'y
M901
Drum motor Ass'y

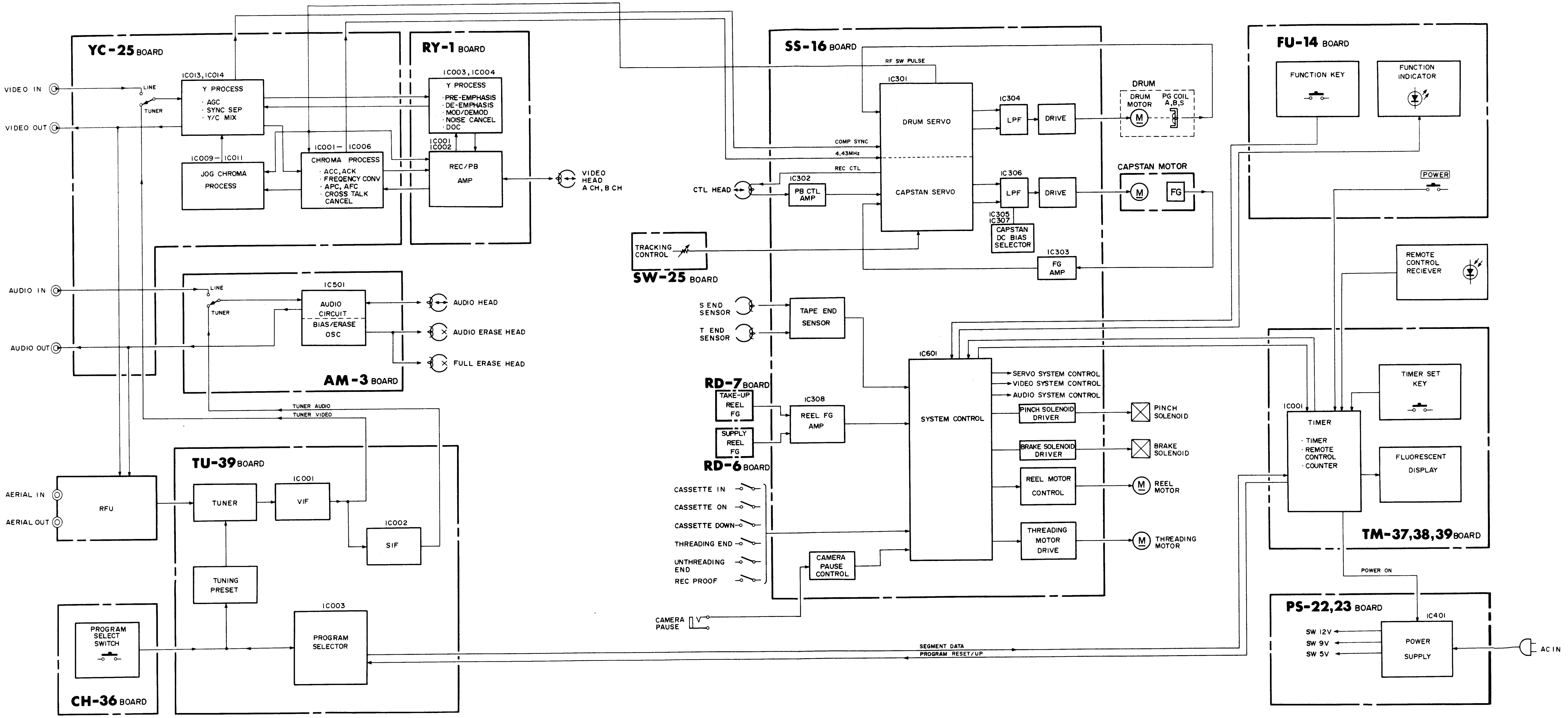
## 2-11. BOARD ARRANGEMENT


Capstan motor board
FWD sensor board
REW sensor board
LM-8 board
RD-7 board
RF unit board
RD-6 board
Reel motor board
SS-16 board
YC-25 board

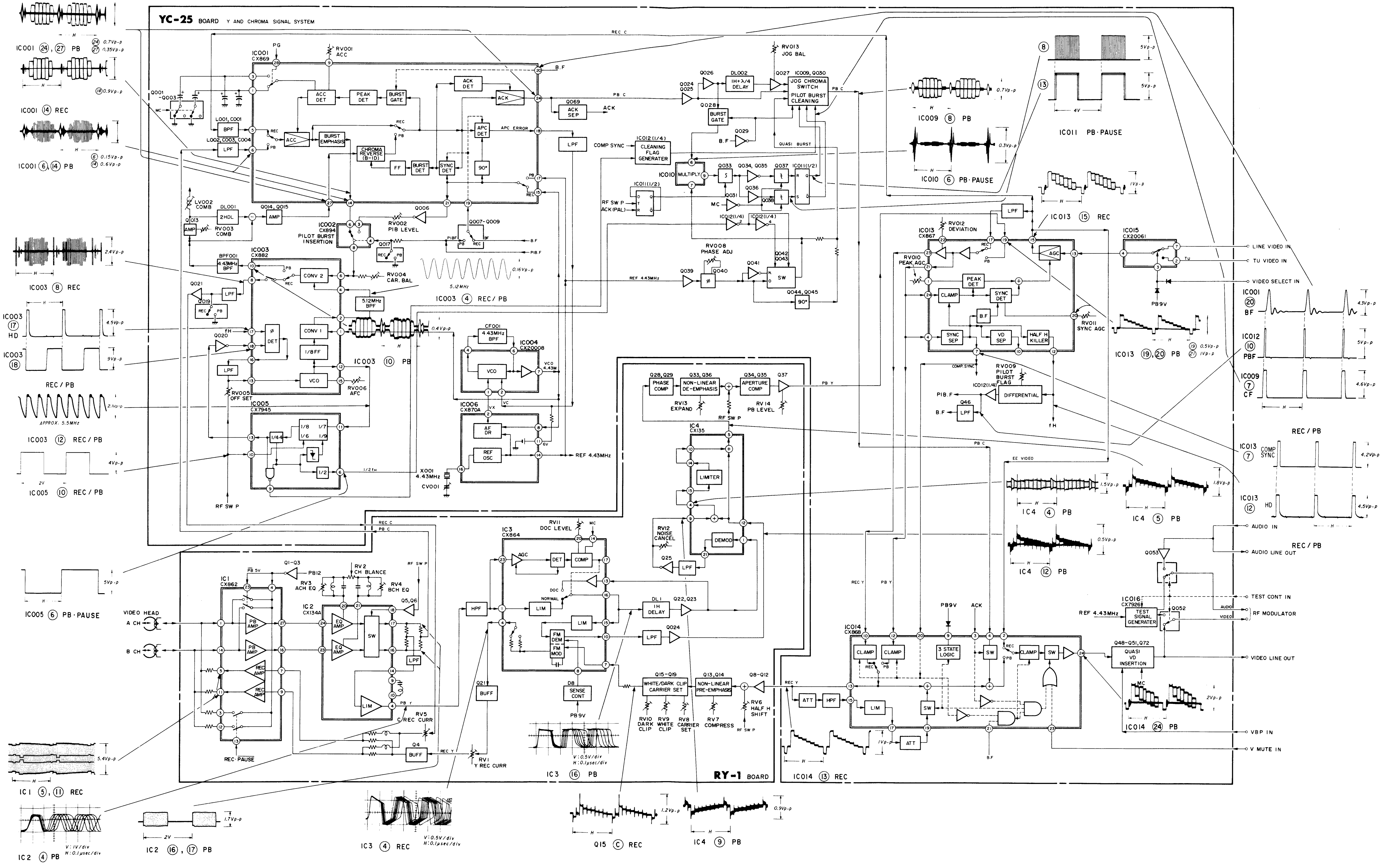

CS-3 board
CS-4 board
PS-22 board
RY-1 board
PS-23 board
MT-4 board
AM-3 board
FU-14 board
N board
TM-38 board
TU-39 board
TM-39 board
CH-36 board
TM-37 board
SW-25 board

# SECTION 3
# DIAGRAMS

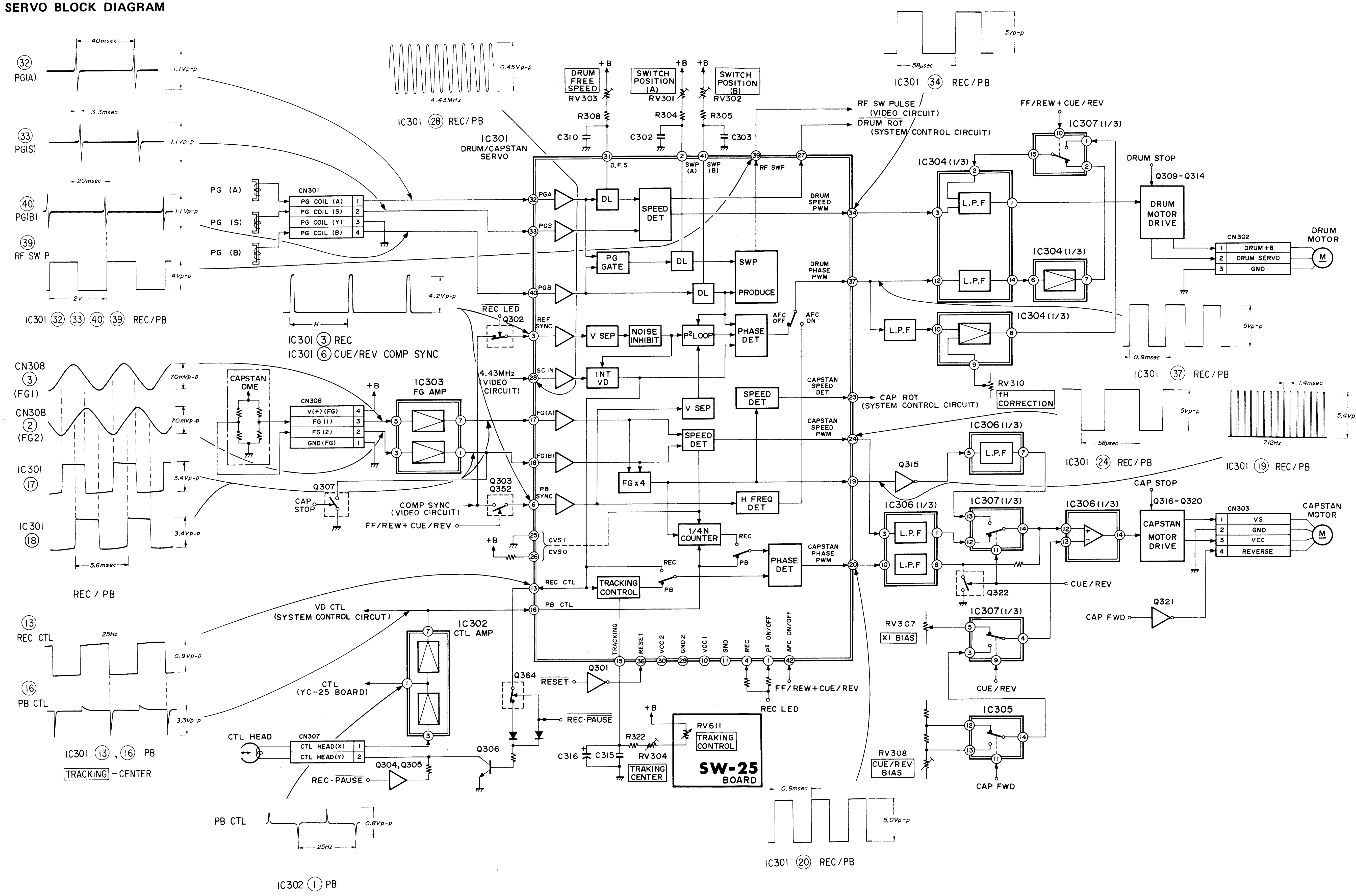
## OVERALL BLOCK DIAGRAM


YC-25 BOARD
VIDEO IN
VIDEO OUT
LINE
TUNER
IC013, IC014
Y PROCESS
· AGC
· SYNC SEP
· Y/C MIX
IC009–IC011
JOG CHROMA PROCESS
IC001–IC006
CHROMA PROCESS
· ACC, ACK
· FREQENCY CONV
· APC, AFC
· CROSS TALK CANCEL
RY-1 BOARD
IC003, IC004
Y PROCESS
· PRE-EMPHASIS
· DE-EMPHASIS
· MOD/DEMOD
· NOISE CANCEL
· DOC
IC001
IC002
REC/PB AMP
VIDEO HEAD A CH, B CH
AUDIO IN
AUDIO OUT
IC501
AUDIO CIRCUIT
BIAS/ERASE OSC
AUDIO HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
AM-3 BOARD
TUNER AUDIO
TUNER VIDEO
AERIAL IN
AERIAL OUT
RFU
TU-39 BOARD
TUNER
IC001
VIF
IC002
SIF
TUNING PRESET
IC003
PROGRAM SELECTOR
PROGRAM SELECT SWITCH
CH-36 BOARD
TRACKING CONTROL
SW-25 BOARD
SS-16 BOARD
RF SW PULSE
IC301
DRUM SERVO
CAPSTAN SERVO
COMP SYNC
4.43MHz
REC CTL
CTL HEAD
IC302
PB CTL AMP
IC304
LPF
DRIVE
IC306
LPF
DRIVE
IC305
IC307
CAPSTAN DC BIAS SELECTOR
IC303
FG AMP
DRUM
DRUM MOTOR
PG COIL A,B,S
M
CAPSTAN MOTOR
M
FG
S END SENSOR
T END SENSOR
TAPE END SENSOR
RD-7 BOARD
TAKE-UP REEL FG
SUPPLY REEL FG
RD-6 BOARD
IC308
REEL FG AMP
IC601
SYSTEM CONTROL
SERVO SYSTEM CONTROL
VIDEO SYSTEM CONTROL
AUDIO SYSTEM CONTROL
PINCH SOLENOID DRIVER
BRAKE SOLENOID DRIVER
REEL MOTOR CONTROL
THREADING MOTOR DRIVE
PINCH SOLENOID
BRAKE SOLENOID
REEL MOTOR
THREADING MOTOR
CASSETTE IN
CASSETTE ON
CASSETTE DOWN
THREADING END
UNTHREADING END
REC PROOF
CAMERA PAUSE CONTROL
CAMERA PAUSE
FU-14 BOARD
FUNCTION KEY
FUNCTION INDICATOR
POWER
REMOTE CONTROL RECIEVER
IC001
TIMER
· TIMER
· REMOTE CONTROL
· COUNTER
TIMER SET KEY
FLUORESCENT DISPLAY
TM-37,38,39 BOARD
POWER ON
PS-22,23 BOARD
IC401
POWER SUPPLY
SW 12V
SW 9V
SW 5V
AC IN
SEGMENT DATA
PROGRAM RESET/UP

# VIDEO BLOCK DIAGRAM

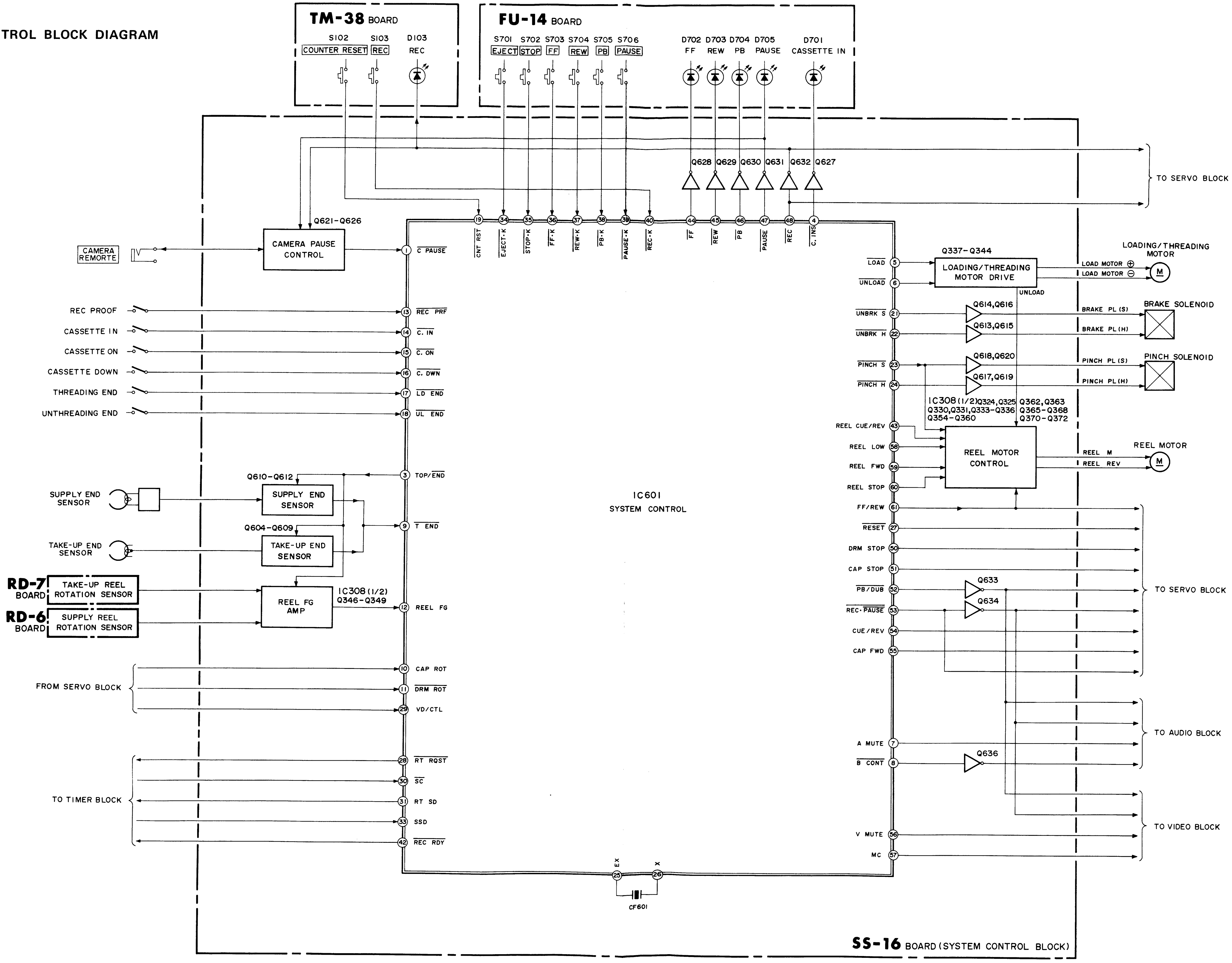

YC-25 BOARD Y AND CHROMA SIGNAL SYSTEM
RY-1 BOARD
IC001 CX869
RV001 ACC
ACC DET
PEAK DET
BURST GATE
ACK DET
ACK
APC DET
APC ERROR
BURST EMPHASIS
CHROMA REVERSE (B-1D)
FF
BURST DET
SYNC DET
90°
L001, C001
BPF
L002, C003, C004
LPF
Q001 - Q003
LV002 COMB
DL001 2HDL
Q013 AMP
RV003 COMB
Q014, Q015 AMP
Q006
IC002 CX894 PILOT BURST INSERTION
RV002 PIB LEVEL
Q007-Q009
Q017
IC003 CX882
BPF001 4.43MHz BPF
CONV 2
RV004 CAR. BAL
5.12MHz BPF
5.12MHz
Q021
Q019
Q020
DET
CONV 1
1/8FF
VCO
RV006 AFC
RV005 OFF SET
IC005 CX7945
1/8 1/7 1/6 1/9
1/44
1/2
1/21H
CF001 4.43MHz BPF
IC004 CX20008
VCO 4.43M
IC006 CX870A
AF DR
REF OSC
X001 4.43MHz
CV001
REF 4.43MHz
RF SW P
Q069 ACK SEP
LPF
COMP SYNC
IC012 (1/4) CLEANING FLAG GENERATOR
IC011 (1/2)
RF SW P
ACK (PAL)
Q024 Q025
Q026
DL002 1H+λ/4 DELAY
Q027 IC009, Q030 JOG CHROMA SWITCH PILOT BURST CLEANING
RV013 JOG BAL
Q028 BURST GATE
Q029
B.F
IC010 MULTIPLY
Q033 Q034, Q035 Q037 IC011 (1/2)
Q031 Q036 Q038
MC
QUASI BURST
RV008 PHASE ADJ
Q039 Q040 Q041 Q042 Q043 SW
Q044, Q045 90°
REF 4.43MHz
PB C
REC C
Q28, Q29 PHASE COMP
Q33, Q36 NON-LINEAR DE-EMPHASIS
Q34, Q35 APERTURE COMP
Q37
RV13 EXPAND
RV14 PB LEVEL
RF SW P
PB Y
IC4 CX135
LIMITER
DEMOD
RV12 NOISE CANCEL
Q25 LPF
IC3 CX864
RV11 DOC LEVEL
AGC DET COMP
DOC NORMAL
LIM
FM DEM
FM MOD
D8 SENSE CONT
PB9V
DL1 1H DELAY
Q22, Q23
Q024 LPF
HPF
Q21 BUFF
Q15-Q19 WHITE/DARK CLIP CARRIER SET
Q13, Q14 NON-LINEAR PRE-EMPHASIS
Q8-Q12
RV10 DARK CLIP
RV9 WHITE CLIP
RV8 CARRIER SET
RV7 COMPRESS
RV6 HALF H SHIFT
IC1 CX862
PB 5V
Q1-Q3 PB12
RV2 CH BLANCE
RV3 ACH EQ
RV4 BCH EQ
IC2 CX134A
EQ AMP
SW
Q5, Q6
LPF
LIM
PB AMP
REC AMP
VIDEO HEAD A CH
B CH
REC·PAUSE
RV5 C/REC CURR
Q4 BUFF
REC Y
RV1 Y REC CURR
IC013 CX867
RV012 DEVIATION
RV010 PEAK AGC
AGC
PEAK DET
CLAMP
SYNC DET
B.F
SYNC SEP
VD SEP
HALF H KILLER
RV011 SYNC AGC
COMP. SYNC
RV009 PILOT BURST FLAG
IC012 (1/4) DIFFERENTIAL
P1B.F
Q46 LPF
fH
IC015 CX20061
LINE VIDEO IN
TU VIDEO IN
VIDEO SELECT IN
PB9V
EE VIDEO
IC014 CX868
CLAMP CLAMP
3 STATE LOGIC
SW CLAMP SW
ATT HPF
LIM SW
ATT
ACK
REC Y
PB Y
AUDIO IN
REC / PB
AUDIO LINE OUT
Q053
TEST CONT IN
IC016 CX7926 TEST SIGNAL GENERATOR
Q052
REF 4.43MHz
RF MODULATOR
Q48-Q51, Q72 QUASI VD INSERTION
VIDEO LINE OUT
VBP IN
V MUTE IN
IC001 ㉔, ㉗ PB
㉔ 0.7Vp-p ㉗ 0.35Vp-p
⑭ 0.9Vp-p
IC001 ⑭ REC
IC001 ⑥, ⑭ PB
⑥ 0.15Vp-p ⑭ 0.6Vp-p
IC003 ⑧ REC 2.4Vp-p
IC003 ⑰ HD 4.5Vp-p
IC003 ⑱ 9Vp-p
REC / PB
2.1Vp-p APPROX. 5.5MHz
IC003 ⑫ REC / PB
IC005 ⑩ REC / PB 4Vp-p 2V
IC005 ⑥ PB·PAUSE 5Vp-p
IC003 ④ REC / PB 0.16Vp-p 5.12MHz
IC003 ⑩ PB 0.4Vp-p
IC009 ⑧ PB 0.7Vp-p
IC010 ⑥ PB·PAUSE 0.3Vp-p
⑧ 5Vp-p
⑬ 5Vp-p 4V
IC011 PB·PAUSE
IC013 ⑮ REC 1Vp-p
IC013 ⑲, ⑳ PB ⑲ 0.5Vp-p ⑳ 1Vp-p
IC001 ⑳ BF 4.3Vp-p
IC012 ⑩ PBF 5Vp-p
IC009 ⑦ CF 4.6Vp-p
REC / PB
IC013 ⑦ COMP SYNC 4.2Vp-p
IC013 ⑫ HD 4.5Vp-p
IC4 ④ PB 1.5Vp-p
IC4 ⑤ PB 1.8Vp-p
IC4 ⑫ PB 0.5Vp-p
IC014 ㉔ PB 2Vp-p
IC014 ⑬ REC 1Vp-p
IC3 ⑯ PB V: 0.5V/div H: 0.1μsec/div
IC1 ⑤, ⑪ REC 5.4Vp-p
IC2 ④ PB V: 1V/div H: 0.1μsec/div
IC2 ⑯, ⑰ PB 1.7Vp-p 2V
IC3 ④ REC V: 0.5V/div H: 0.1μsec/div
Q15 Ⓒ REC 1.2Vp-p
IC4 ⑨ PB 0.9Vp-p

## SERVO BLOCK DIAGRAM



40msec
(32) PG(A)
1.1Vp-p
3.3msec
(33) PG(S)
1.1Vp-p
20msec
(40) PG(B)
1.1Vp-p
(39) RF SW P
4Vp-p
2V
IC301 (32) (33) (40) (39) REC/PB
0.45Vp-p
4.43MHz
IC301 (28) REC/PB
IC301 DRUM/CAPSTAN SERVO
PG (A)
PG (S)
PG (B)
CN301
PG COIL (A) 1
PG COIL (S) 2
PG COIL (Y) 3
PG COIL (B) 4
4.2Vp-p
H
IC301 (3) REC
IC301 (6) CUE/REV COMP SYNC
REC LED
Q302
CN308 (3) (FG1)
70mVp-p
CN308 (2) (FG2)
70mVp-p
IC301 (17)
3.4Vp-p
IC301 (18)
3.4Vp-p
5.6msec
REC / PB
CAPSTAN DME
CN308
V(+)(FG) 4
FG (1) 3
FG (2) 2
GND (FG) 1
+B
IC303 FG AMP
4.43MHz (VIDEO CIRCUIT)
Q307
CAP STOP
COMP SYNC (VIDEO CIRCUIT)
Q303 Q352
FF/REW+CUE/REV
(13) REC CTL
25Hz
0.9Vp-p
(16) PB CTL
3.3Vp-p
IC301 (13), (16) PB
TRACKING - CENTER
VD CTL (SYSTEM CONTROL CIRCUIT)
IC302 CTL AMP
CTL (YC-25 BOARD)
CTL HEAD
CN307
CTL HEAD(X) 1
CTL HEAD(Y) 2
Q304, Q305
REC·PAUSE
Q306
Q364
REC·PAUSE
PB CTL
0.8Vp-p
25Hz
IC302 (1) PB
+B
DRUM FREE SPEED
RV303
R308
C310
SWITCH POSITION (A)
RV301
R304
C302
SWITCH POSITION (B)
RV302
R305
C303
D.F.S
SWP (A)
SWP (B)
RF SWP
PGA
PGS
PGB
REF SYNC
SC IN
FG(A)
FG(B)
PB SYNC
CVS I
CVS O
REC CTL
PB CTL
DL
SPEED DET
PG GATE
DL
DL
SWP PRODUCE
V SEP
NOISE INHIBIT
P²LOOP
PHASE DET
AFC OFF
AFC ON
INT VD
V SEP
SPEED DET
SPEED DET
FGx4
H FREQ DET
1/4N COUNTER
REC
PB
PHASE DET
TRACKING CONTROL
REC
PB
DRUM SPEED PWM
DRUM PHASE PWM
CAPSTAN SPEED DET
CAPSTAN SPEED PWM
CAPSTAN PHASE PWM
TRACKING
RESET
VCC 2
GND 2
VCC 1
GND
REC
P² ON/OFF
AFC ON/OFF
Q301
RESET
FF/REW+CUE/REV
REC LED
+B
R322
C316
C315
RV304
TRAKING CENTER
RV611
TRAKING CONTROL
SW-25 BOARD
5Vp-p
58μsec
IC301 (34) REC/PB
RF SW PULSE (VIDEO CIRCUIT)
DRUM ROT (SYSTEM CONTROL CIRCUIT)
FF/REW+CUE/REV
IC307 (1/3)
IC304 (1/3)
L.P.F
L.P.F
IC304 (1/3)
DRUM STOP
Q309-Q314
DRUM MOTOR DRIVE
CN302
1 DRUM+B
2 DRUM SERVO
3 GND
DRUM MOTOR
M
IC304 (1/3)
L.P.F
RV310
fH CORRECTION
5Vp-p
0.9msec
IC301 (37) REC/PB
CAP ROT (SYSTEM CONTROL CIRCUIT)
5Vp-p
58μsec
1.4msec
5.4Vp-p
712Hz
IC306 (1/3)
L.P.F
Q315
IC301 (24) REC/PB
IC301 (19) REC/PB
CAP STOP
Q316-Q320
IC306 (1/3)
L.P.F
L.P.F
IC307 (1/3)
IC306 (1/3)
CAPSTAN MOTOR DRIVE
CN303
1 VS
2 GND
3 VCC
4 REVERSE
CAPSTAN MOTOR
M
Q322
CUE/REV
Q321
CAP FWD
RV307
X1 BIAS
IC307 (1/3)
CUE/REV
IC305
RV308
CUE/REV BIAS
CAP FWD
0.9msec
5.0Vp-p
IC301 (20) REC/PB

## SYSTEM CONTROL BLOCK DIAGRAM


TM-38 BOARD
S102 COUNTER RESET
S103 REC
D103 REC
FU-14 BOARD
S701 EJECT
S702 STOP
S703 FF
S704 REW
S705 PB
S706 PAUSE
D702 FF
D703 REW
D704 PB
D705 PAUSE
D701 CASSETTE IN
Q628 Q629 Q630 Q631 Q632 Q627
TO SERVO BLOCK
Q621-Q626
CAMERA REMORTE
CAMERA PAUSE CONTROL
C PAUSE
CNT RST
EJECT-K
STOP-K
FF-K
REW-K
PB-K
PAUSE-K
REC-K
FF
REW
PB
PAUSE
REC
C. INS
REC PROOF
CASSETTE IN
CASSETTE ON
CASSETTE DOWN
THREADING END
UNTHREADING END
REC PRF
C. IN
C. ON
C. DWN
LD END
UL END
Q610-Q612
SUPPLY END SENSOR
SUPPLY END SENSOR
TOP/END
Q604-Q609
TAKE-UP END SENSOR
TAKE-UP END SENSOR
T END
RD-7 BOARD
TAKE-UP REEL ROTATION SENSOR
RD-6 BOARD
SUPPLY REEL ROTATION SENSOR
REEL FG AMP
IC308 (1/2) Q346-Q349
REEL FG
FROM SERVO BLOCK
CAP ROT
DRM ROT
VD/CTL
TO TIMER BLOCK
RT RQST
SC
RT SD
SSD
REC RDY
IC601 SYSTEM CONTROL
EX
X
CF601
Q337-Q344
LOAD
UNLOAD
LOADING/THREADING MOTOR DRIVE
UNLOAD
LOADING/THREADING MOTOR
LOAD MOTOR ⊕
LOAD MOTOR ⊖
M
UNBRK S
UNBRK H
Q614,Q616
Q613,Q615
BRAKE PL (S)
BRAKE PL (H)
BRAKE SOLENOID
PINCH S
PINCH H
Q618,Q620
Q617,Q619
PINCH PL (S)
PINCH PL (H)
PINCH SOLENOID
IC308 (1/2) Q324,Q325 Q362,Q363
Q330,Q331,Q333-Q336 Q365-Q368
Q354-Q360 Q370-Q372
REEL CUE/REV
REEL LOW
REEL FWD
REEL STOP
REEL MOTOR CONTROL
REEL M
REEL REV
REEL MOTOR
FF/REW
RESET
DRM STOP
CAP STOP
PB/DUB
REC·PAUSE
CUE/REV
CAP FWD
Q633
Q634
TO SERVO BLOCK
TO AUDIO BLOCK
A MUTE
B CONT
Q636
TO VIDEO BLOCK
V MUTE
MC
SS-16 BOARD (SYSTEM CONTROL BLOCK)

## SYSTEM CONTROL CIRCUIT AND MECHANISM BLOCK INTERFACE

| SIGNAL | I/O | Pin No. | EJECTED | LOADING | THREADING | STOP | UN-THREADING | UN-LOADING | FF | REW | PB | PB·PAUSE | PICTURE SEARCH | | REC | REC·PAUSE | TIMER REC | FR SEARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | CUE | REV | | | | CUE | REV |
| REC PROOF | I | IC601 13pin | H | H | H/L | H/L | H/L | H | H/L | H/L | H/L | H/L | H/L | H/L | L | L | L | H/L | H/L |
| C·IN | I | IC601 14pin | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| C·ON | I | IC601 15pin | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| C·DWN | I | IC601 16pin | H | H | L | L | L | H | L | L | L | L | L | L | L | L | L | L | L |
| LD END | I | IC601 17pin | H | H | H | L | H | H | L | L | L | L | L | L | L | L | L | L | L |
| UL END | I | IC601 18pin | L | L | H | H | H | L | H | H | H | H | H | H | H | H | H | H | H |
| | | | | | | | | | | | | | | | | | | | |
| UNBRK S | O | IC601 21pin | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| UNBRK H | O | IC601 22pin | H | H | L | H | L | H | L | L | L | H | L | L | L | H | L | L | L |
| PINCH S | O | IC601 23pin | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| PINCH H | O | IC601 24pin | H | L | H | H | H | L | H | H | L | H | L | L | L | H | L | H | H |
| LOAD | O | IC601 5pin | H | L | L | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| UNLOAD | O | IC601 6pin | H | H | H | H | L | L | H | H | H | H | H | H | H | H | H | H | H |

## SYSTEM CONTROL CIRCUIT AND REMOTE CONTROL/TIMER CIRCUIT INTERFACE

| SIGNAL | I/O | Pin No. | STOP | FF | REW | PB | PB·PAUSE | PICTURE SEARCH | | REC | REC·PAUSE | TIMER REC | FR SEARCH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | CUE | REV | | | | CUE | REV |
| RT RQST | I | IC601 28pin | | | | | | | | | | | | |
| RTSD | I | IC601 31pin | | | | | | | | | | | | |
| COUNTER RESET | I | IC601 19pin | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| SSD | O | IC601 33pin | | | | | | | | | | | | |
| SC | O | IC601 30pin | | | | | | | | | | | | |
| REC READY | O | IC601 42pin | H/L | H | H | H | H | H | H | H | H | L | H | H |

## SYSTEM CONTROL CIRCUIT AND FUNCTION BLOCK INTERF

| SIGNAL | I/O | Pin No. | STOP | FF | REW |
|---|---|---|---|---|---|
| EJECT·K | I | IC601 34pin | H | H | H |
| STOP·K | I | IC601 35pin | H | H | H |
| FF·K | I | IC601 36pin | H | H | H |
| REW·K | I | IC601 37pin | H | H | H |
| PB·K | I | IC601 38pin | H | H | H |
| PAUSE·K | I | IC601 39pin | H | H | H |
| REC·K | I | IC601 40pin | H | H | H |
| | | | | | |
| | | | | | |
| FF | O | IC601 44pin | H | L | H |
| REW | O | IC601 45pin | H | H | L |
| PB | O | IC601 46pin | H | H | H |
| PAUSE | O | IC601 47pin | H | H | H |
| REC | O | IC601 48pin | H | H | H |
| | | | | | |
| C·IN | O | IC601 4pin | L | L | L |

## SYSTEM CONTROL CIRCUIT AND ITS PERIPHERAL CIRCUIT

| SIGNAL | I/O | Pin No. | STOP | FF | REW |
|---|---|---|---|---|---|
| TEND*[1] | I | IC601 9pin | H | H | H |
| C·PAUSE*[2] | I | IC601 1pin | H | H | H |
| | | | | | |
| TOP/END | O | IC601 3pin | L | L | H |

*1 "L" at tape end.

*2 Camera pause signal.

| PB | PB·PAUSE | PICTURE SEARCH |  | REC | REC·PAUSE | TIMER REC | FR SEARCH |  |
|---|---|---|---|---|---|---|---|---|
|  |  | CUE | REV |  |  |  | CUE | REV |
| H/L | H/L | H/L | H/L | L | L | L | H/L | H/L |
| L | L | L | L | L | L | L | L | L |
| L | L | L | L | L | L | L | L | L |
| L | L | L | L | L | L | L | L | L |
| L | L | L | L | L | L | L | L | L |
| H | H | H | H | H | H | H | H | H |
|  |  |  |  |  |  |  |  |  |
| H | H | H | H | H | H | H | H | H |
| L | H | L | L | L | H | L | L | L |
| H | H | H | H | H | H | H | H | H |
| L | H | L | L | L | H | L | H | H |
| H | H | H | H | H | H | H | H | H |
| H | H | H | H | H | H | H | H | H |

| REC·PAUSE | TIMER REC | FR SEARCH |  |
|---|---|---|---|
|  |  | CUE | REV |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| H | L | H | H |

SYSTEM CONTROL CIRCUIT AND FUNCTION BLOCK INTERFACE

| MODE / SIGNAL | I/O | Pin No. | STOP | FF | REW | PB | PB·PAUSE | PICTURE SEARCH |  | REC | REC·PAUSE | TIMER REC | FR SEARCH |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  | CUE | REV |  |  |  | CUE | REV |
| $\overline{\text{EJECT·K}}$ | I | IC601 34pin | H | H | H | H | H | H | H | H | H | H | H | H |
| $\overline{\text{STOP·K}}$ | I | IC601 35pin | H | H | H | H | H | H | H | H | H | H | H | H |
| $\overline{\text{FF·K}}$ | I | IC601 36pin | H | H | H | H | H | L | H | H | H | H | L | H |
| $\overline{\text{REW·K}}$ | I | IC601 37pin | H | H | H | H | H | H | L | H | H | H | H | L |
| $\overline{\text{PB·K}}$ | I | IC601 38pin | H | H | H | H | H | H | H | H | H | H | H | H |
| $\overline{\text{PAUSE·K}}$ | I | IC601 39pin | H | H | H | H | H | H | H | H | H | H | H | H |
| $\overline{\text{REC·K}}$ | I | IC601 40pin | H | H | H | H | H | H | H | H | H | H | H | H |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\overline{\text{FF}}$ | O | IC601 44pin | H | L | H | H | H | L | H | H | H | H | L | H |
| $\overline{\text{REW}}$ | O | IC601 45pin | H | H | L | H | H | H | L | H | H | H | H | L |
| $\overline{\text{PB}}$ | O | IC601 46pin | H | H | H | L | L | L | L | H | H | H | L | L |
| $\overline{\text{PAUSE}}$ | O | IC601 47pin | H | H | H | H | L | H | H | H | L | H | H | H |
| $\overline{\text{REC}}$ | O | IC601 48pin | H | H | H | H | H | H | H | L | L | L | H | H |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\overline{\text{C·IN}}$ | O | IC601 4pin | L | L | L | L | L | L | L | L | L | L | L | L |

SYSTEM CONTROL CIRCUIT AND ITS PERIPHERAL CIRCUIT INTERFACE

| MODE / SIGNAL | I/O | Pin No. | STOP | FF | REW | PB | PB·PAUSE | PICTURE SEARCH |  | REC | REC·PAUSE | TIMER REC | FR SEARCH |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  | CUE | REV |  |  |  | CUE | REV |
| TEND*1 | I | IC601 9pin | H | H | H | H | H | H | H | H | H | H | H | H |
| C·PAUSE*2 | I | IC601 1pin | H | H | H | H | H | H | H | H | H | H | H | H |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TOP/END | O | IC601 3pin | L | L | H | L | L | L | H | L | L | L | L | H |

*1 "L" at tape end.

*2 Camera pause signal.

## SYSTEM CONTROL CIRCUIT AND REEL MOTOR CONTROL CIRCUIT INTERFACE

| SIGNAL | I/O | Pin No. | EJECTED | LOADING | THREADING | STOP | UN-THREADING | UN-LOADING | FF | REW | PB | PB·PAUSE | PICTURE SEARCH CUE | PICTURE SEARCH REV | REC | REC·PAUSE | TIMER REC | FR SEARCH CUE | FR SEARCH REV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REEL FG | I | IC601 12pin | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| REEL LOW | O | IC601 58pin | L | L | H | L | H | L | L | L | H | H | L | L | H | H | H | H | H |
| REEL FWD | O | IC601 59pin | H | H | H | H | L | H | H | L | H | H | H | L | H | H | H | H | L |
| REEL STOP | O | IC601 60pin | H | H | L | H | L | H | L | L | L | H | L | L | L | H | L | L | L |
| FF/REW | O | IC601 61pin | L | L | L | L | L | L | H | H | L | L | L | L | L | L | L | H | H |
| REEL CUE/REV | O | IC601 43pin | L | L | L | L | L | L | L | L | L | L | H | H | L | L | L | L | L |
| $\overline{\text{PINCH S}}$ | O | IC601 23pin | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H |
| TOP/$\overline{\text{END}}$ | O | IC601 3pin | L | L | L | L | L | L | L | H | L | L | L | H | L | L | L | L | H |
| $\overline{\text{UNLOAD}}$ | O | IC601 6pin | H | H | H | H | L | L | H | H | H | H | H | H | H | H | H | H | H |

## SYSTEM CONTROL CIRCUIT AND VIDEO CIRCUIT INTERFACE

| SIGNAL | I/O | Pin No. | STOP (E-E) | FF | REW | PB | PB·PAUSE | PICTURE SEARCH CUE | PICTURE SEARCH REV | REC | REC·PAUSE | TIMER REC | FR SEARCH CUE | FR SEARCH REV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V MUTE | O | IC601 56pin | L | L | L | L | L | L | L | L | L | L | L | L |
| MC | O | IC601 57pin | L | L | L | L | H | H | H | L | L | L | H | H |
| $\overline{\text{REC·PAUSE}}$ | O | IC601 53pin | H | H | H | H | H | H | H | L | H | L | H | H |
| $\overline{\text{PB + DUB}}$ | O | IC601 52pin | H | H | H | L | L | L | L | H | H | H | L | L |

## SYSTEM CONTROL CIRCUIT AND SERVO CIRCUIT IN

| SIGNAL | I/O | Pin No. | STOP | FF |
|---|---|---|---|---|
| $\overline{\text{DRUM ROT}}$ | I | IC601 11pin | H | L |
| CAP ROT | I | IC601 10pin | L | L |
| VD/CTL | I | IC601 29pin | | CTL |
| | | | | |
| DRUM STOP | O | IC601 50pin | H | L |
| CAP STOP | O | IC601 51pin | H | H |
| $\overline{\text{PB + DUB}}$ | O | IC601 52pin | H | H |
| $\overline{\text{REC·PAUSE}}$ | O | IC601 53pin | H | H |
| CUE/REV | O | IC601 54pin | L | L |
| CAP FWD | O | IC601 55pin | H | H |
| $\overline{\text{194 RESET}}$*1 | O | IC601 27pin | H | H |

*1 Reset signal for CX194.

## SYSTEM CONTROL CIRCUIT AND AUDIO CIRCUIT IN

| SIGNAL | I/O | Pin No. | STOP (E-E) | FF |
|---|---|---|---|---|
| A MUTE | O | IC601 7pin | L | L |
| B CONT | O | IC601 8pin | H | H |
| $\overline{\text{REC·PAUSE}}$ | O | IC601 53pin | H | H |
| $\overline{\text{PB + DUB}}$ | O | IC601 52pin | H | H |

| PB | PB·PAUSE | PICTURE SEARCH |  | REC | REC·PAUSE | TIMER REC | FR SEARCH |  |
|---|---|---|---|---|---|---|---|---|
|  |  | CUE | REV |  |  |  | CUE | REV |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| H | H | L | L | H | H | H | H | H |
| H | H | H | L | H | H | H | H | L |
| L | H | L | L | L | H | L | L | L |
| L | L | L | L | L | L | L | H | H |
| L | L | H | H | L | L | L | L | L |
| H | H | H | H | H | H | H | H | H |
| L | L | L | H | L | L | L | L | H |
| H | H | H | H | H | H | H | H | H |

| REC·PAUSE | TIMER REC | FR SEARCH |  |
|---|---|---|---|
|  |  | CUE | REV |
| L | L | L | L |
| L | L | H | H |
| H | L | H | H |
| H | H | L | L |

## SYSTEM CONTROL CIRCUIT AND SERVO CIRCUIT INTERFACE

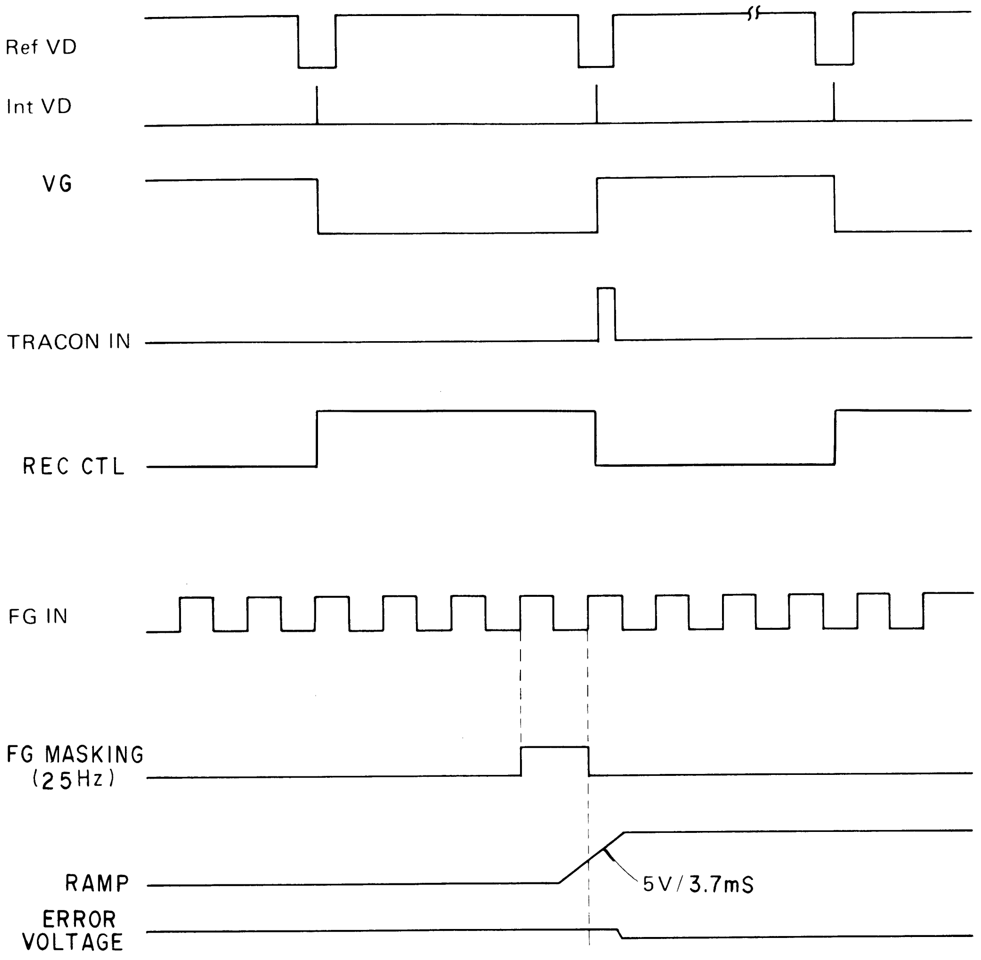
| MODE / SIGNAL | I/O | Pin No. | STOP | FF | REW | PB | PB·PAUSE | PICTURE SEARCH |  | REC | REC·PAUSE | TIMER REC | FR SEARCH |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  | CUE | REV |  |  |  | CUE | REV |
| $\overline{\text{DRUM ROT}}$ | I | IC601 11pin | H | L | L | L | L | L | L | L | L | L | L | L |
| CAP ROT | I | IC601 10pin | L | L | L | H | H | H | H | H | H | H | L | L |
| VD/CTL | I | IC601 29pin |  | CTL | CTL | CTL |  | CTL | CTL | VD |  | VD | CTL | CTL |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DRUM STOP | O | IC601 50pin | H | L | L | L | L | L | L | L | L | L | L | L |
| CAP STOP | O | IC601 51pin | H | H | H | L | L | L | L | L | L | L | H | H |
| $\overline{\text{PB + DUB}}$ | O | IC601 52pin | H | H | H | L | L | L | L | H | H | H | L | L |
| $\overline{\text{REC·PAUSE}}$ | O | IC601 53pin | H | H | H | H | H | H | H | L | H | L | H | H |
| CUE/REV | O | IC601 54pin | L | L | L | L | L | H | H | L | L | L | L | L |
| CAP FWD | O | IC601 55pin | H | H | H | H | H | H | L | H | H | H | H | H |
| $\overline{\text{194 RESET}}$*[1] | O | IC601 27pin | H | H | H | H | H | H | H | H | H | H | H | H |

*1 Reset signal for CX194.

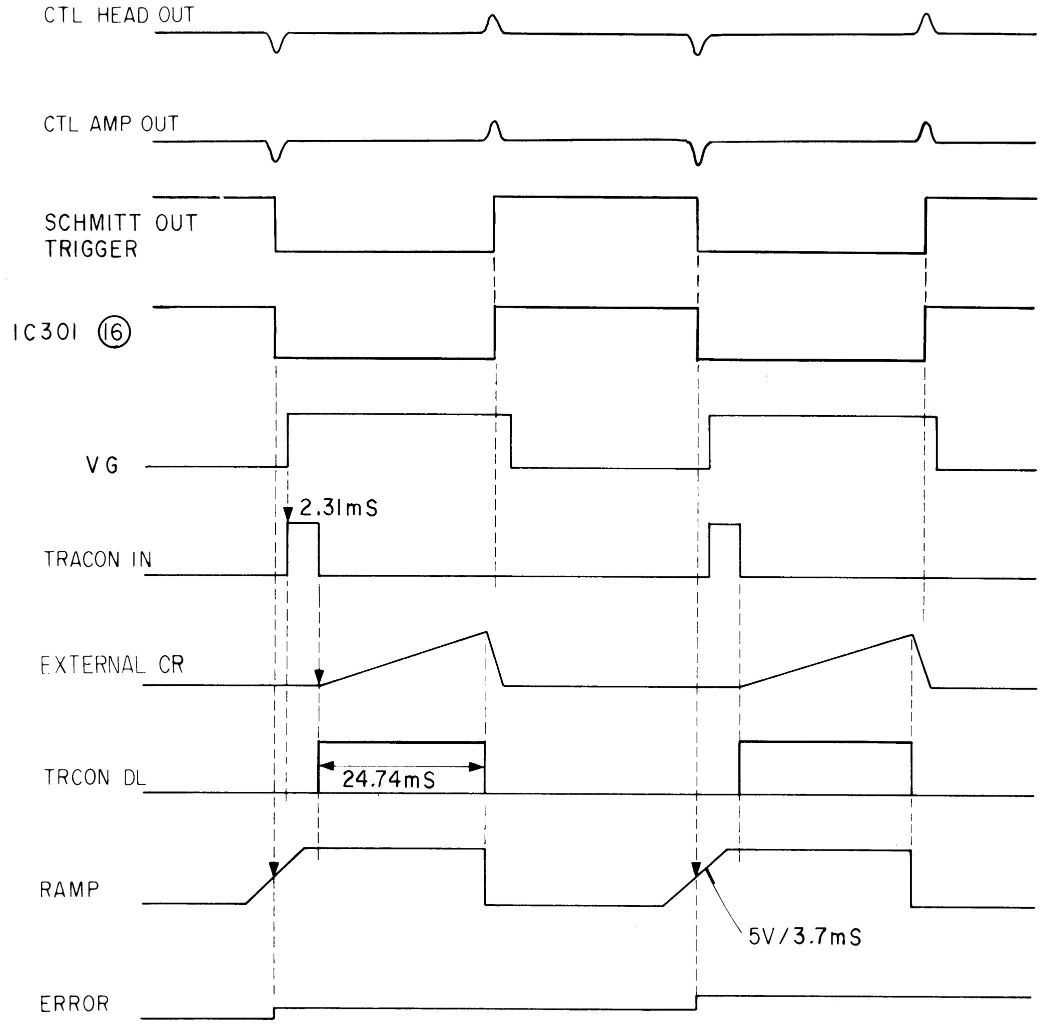
## SYSTEM CONTROL CIRCUIT AND AUDIO CIRCUIT INTERFACE

| MODE / SIGNAL | I/O | Pin No. | STOP (E-E) | FF | REW | PB | PB·PAUSE | PICTURE SEARCH |  | REC | REC·PAUSE | TIMER REC | FR SEARCH |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  | CUE | REV |  |  |  | CUE | REV |
| A MUTE | O | IC601 7pin | L | L | L | L | H | H | H | L | L | L | H | H |
| B CONT | O | IC601 8pin | H | H | H | H | H | H | H | L | H | L | H | H |
| $\overline{\text{REC·PAUSE}}$ | O | IC601 53pin | H | H | H | H | H | H | H | L | H | L | H | H |
| $\overline{\text{PB + DUB}}$ | O | IC601 52pin | H | H | H | L | L | L | L | H | H | H | L | L |

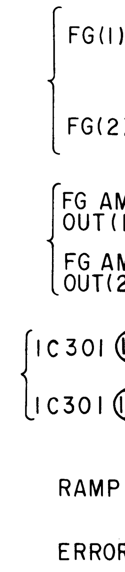
## CAPSTAN PHASE SYSTEM TIMING CHART (REC)


Ref VD
Int VD
VG
TRACON IN
REC CTL
FG IN
FG MASKING
(25Hz)
RAMP
5V/3.7mS
ERROR
VOLTAGE

## CAPSTAN PHASE SYSTEM TIMING CHART (PB)


CTL HEAD OUT
CTL AMP OUT
SCHMITT OUT
TRIGGER
IC301 ⑯
VG
2.31mS
TRACON IN
EXTERNAL CR
TRCON DL
24.74mS
RAMP
5V/3.7mS
ERROR

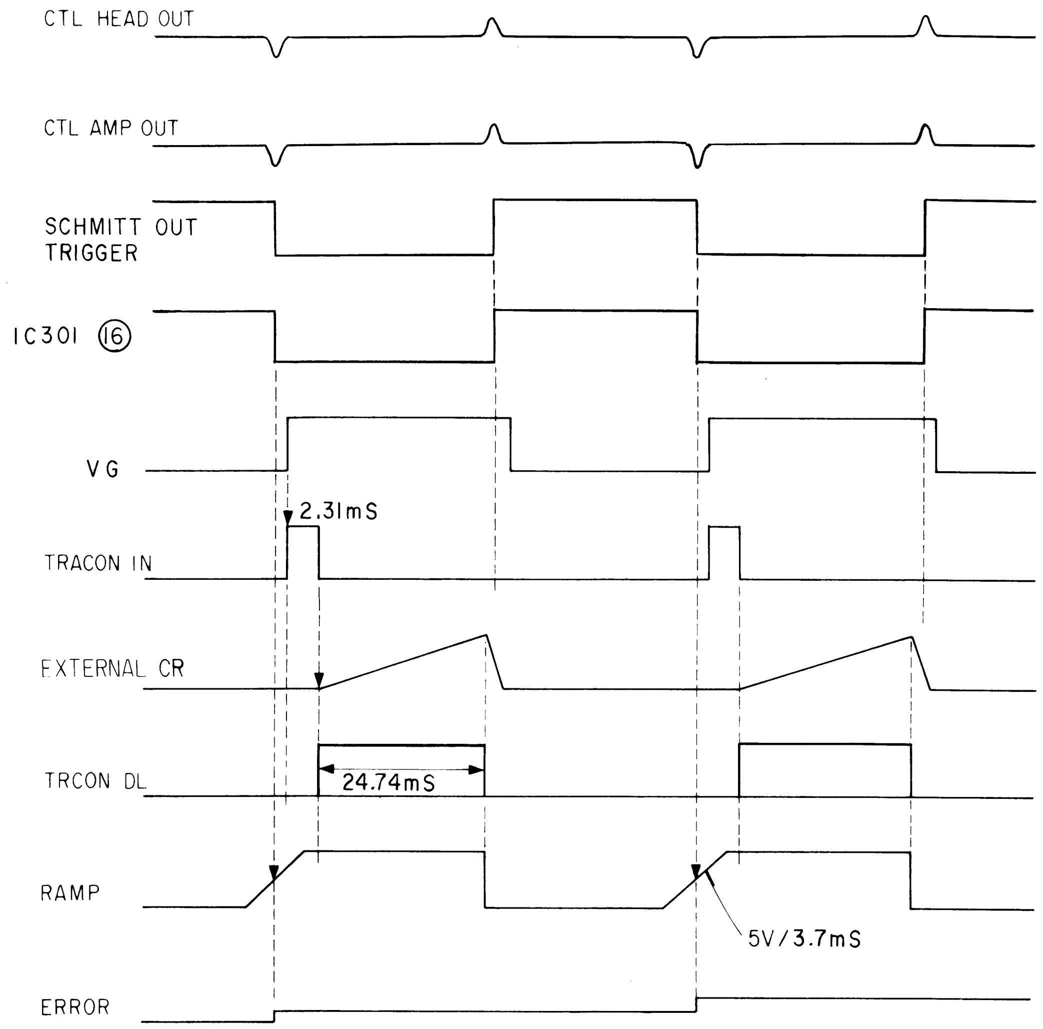
## CAPSTAN


FG(1)
FG(2
FG AM
OUT(
FG AM
OUT(2
IC301
IC301
RAMP
ERROR

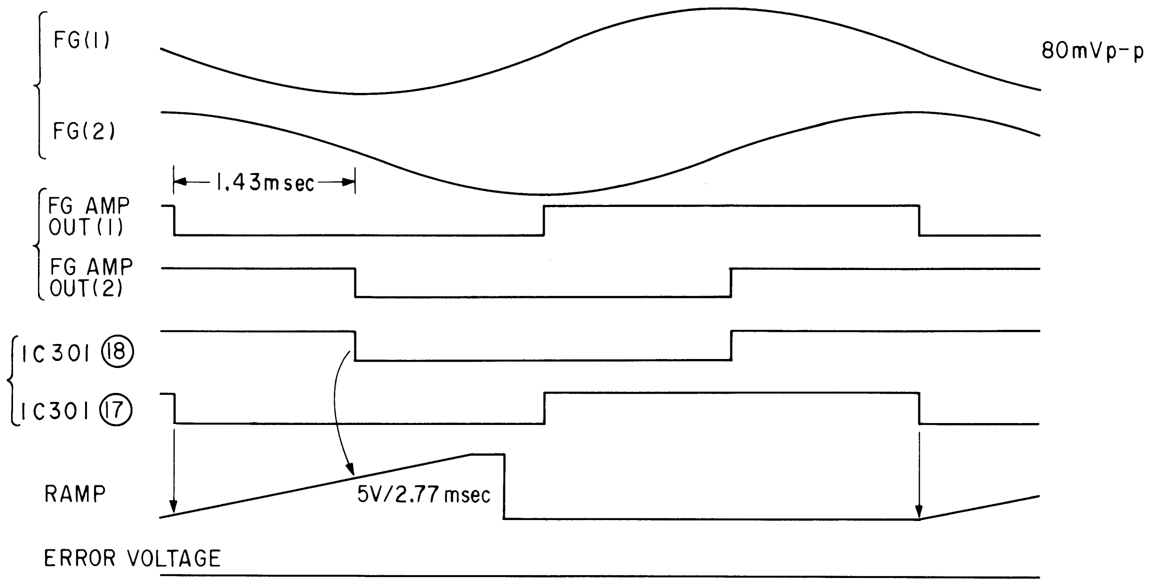
## DRUM PH

PHASE ERROR

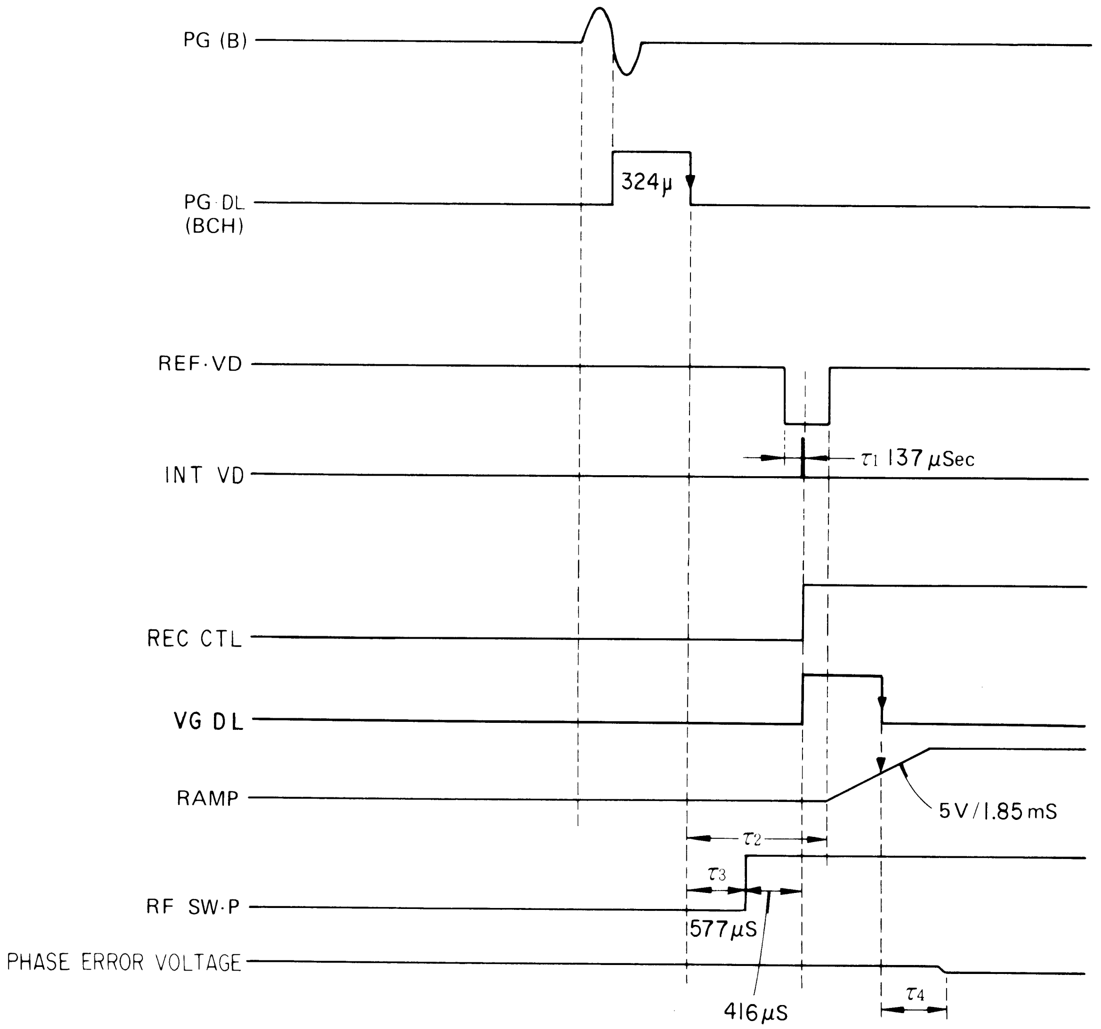
## CAPSTAN PHASE SYSTEM TIMING CHART (PB)


CTL HEAD OUT
CTL AMP OUT
SCHMITT OUT
TRIGGER
IC301 ⑯
VG
2.31mS
TRACON IN
EXTERNAL CR
TRCON DL
24.74mS
RAMP
5V/3.7mS
ERROR

## CAPSTAN SPEED SYSTEM TIMING CHART

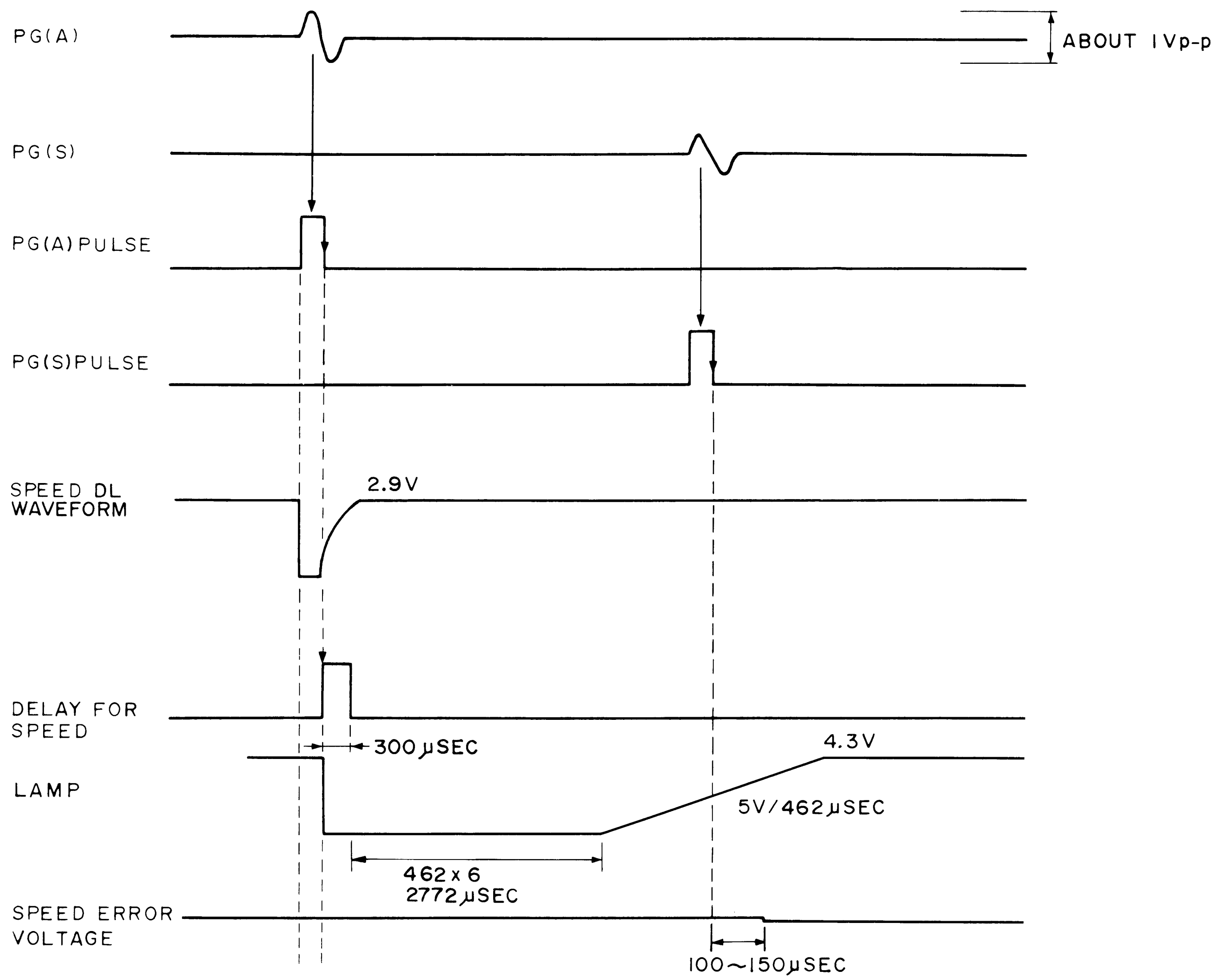

FG(1)
FG(2)
80mVp-p
1.43msec
FG AMP OUT(1)
FG AMP OUT(2)
IC301 ⑱
IC301 ⑰
RAMP
5V/2.77msec
ERROR VOLTAGE

## DRUM PHASE SYSTEM TIMING CHART

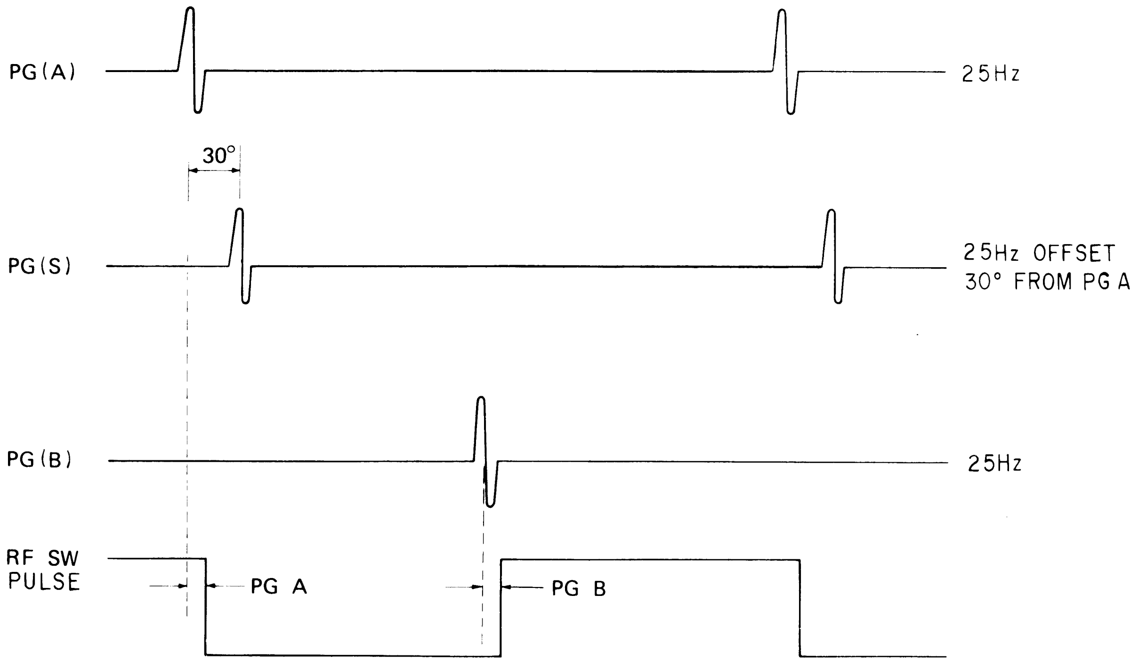

PG (B)
PG DL
(BCH)
324μ
REF·VD
INT VD
τ1 137μSec
REC CTL
VG DL
RAMP
5V/1.85mS
τ2
τ3
RF SW·P
577μS
PHASE ERROR VOLTAGE
416μS
τ4

$\tau_1$ REF VD DETECTION DELAY TIME
$\tau_{2,3}$ DIGITAL DL
$\tau_4$ DATA EXCHANGE TIME

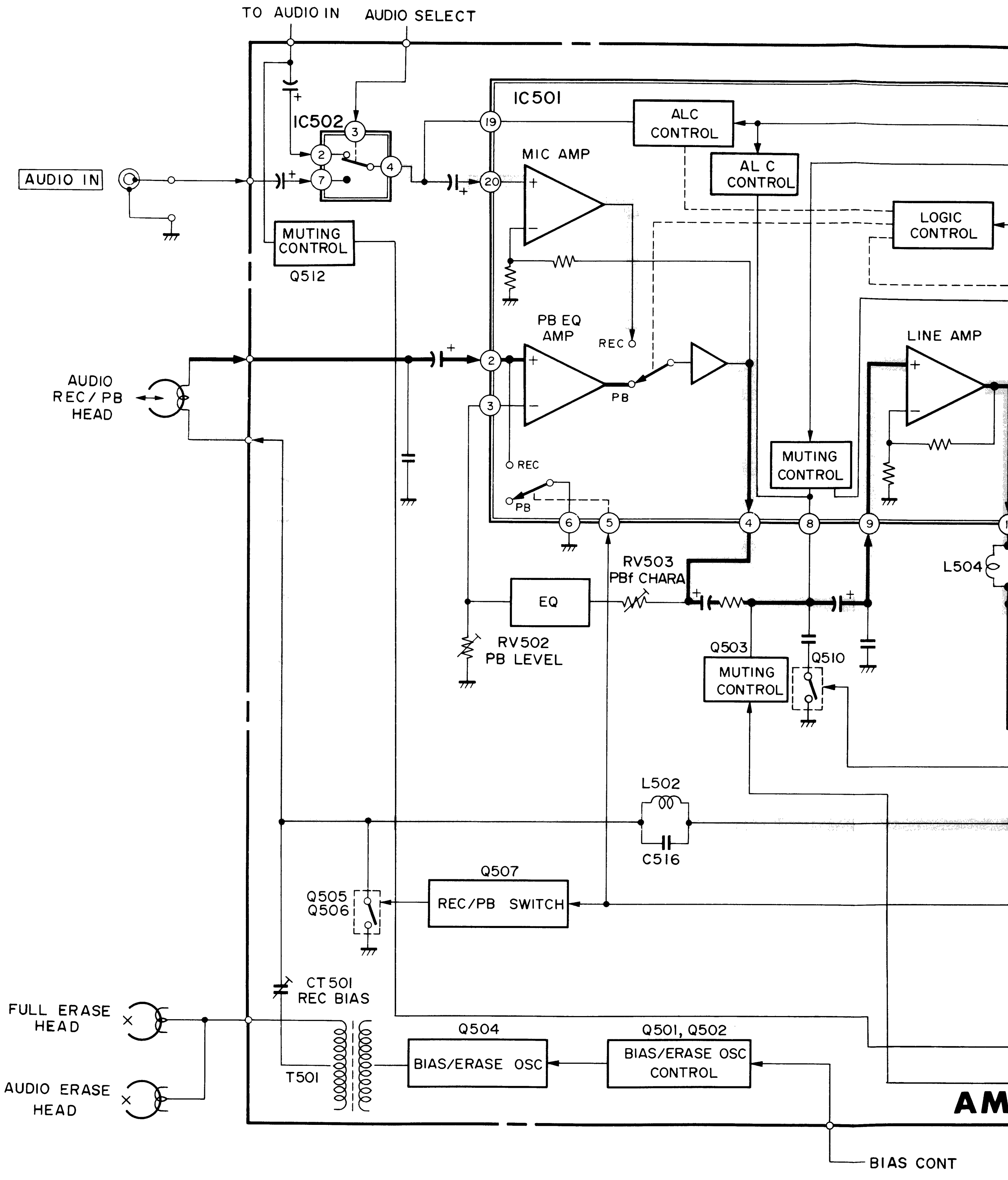
## DRUM SPEED SYSTEM TIMING CHART



## PG SIGNAL TIMING CHART

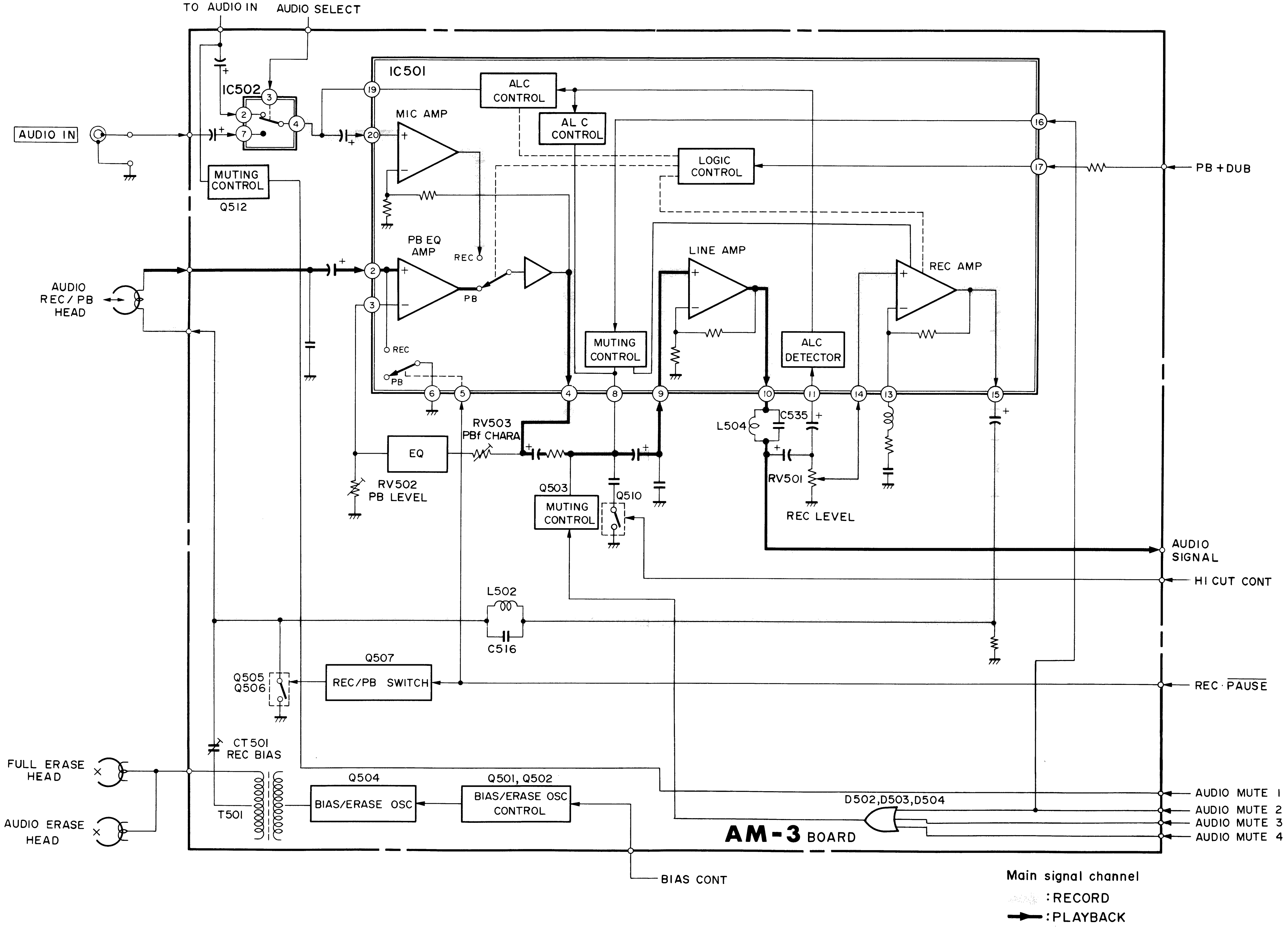


## AUDIO BLOCK DIAGRAM


TO AUDIO IN
AUDIO SELECT
IC501
ALC CONTROL
AL C CONTROL
LOGIC CONTROL
IC502
MIC AMP
AUDIO IN
MUTING CONTROL
Q512
PB EQ AMP
REC
PB
LINE AMP
AUDIO REC/PB HEAD
REC
PB
L
MUTING CONTROL
RV503 PBf CHARA
L504
EQ
RV502 PB LEVEL
Q503
MUTING CONTROL
Q510
L502
C516
Q507
Q505
Q506
REC/PB SWITCH
CT501 REC BIAS
FULL ERASE HEAD
AUDIO ERASE HEAD
T501
Q504
BIAS/ERASE OSC
Q501, Q502
BIAS/ERASE OSC CONTROL
AM
BIAS CONT

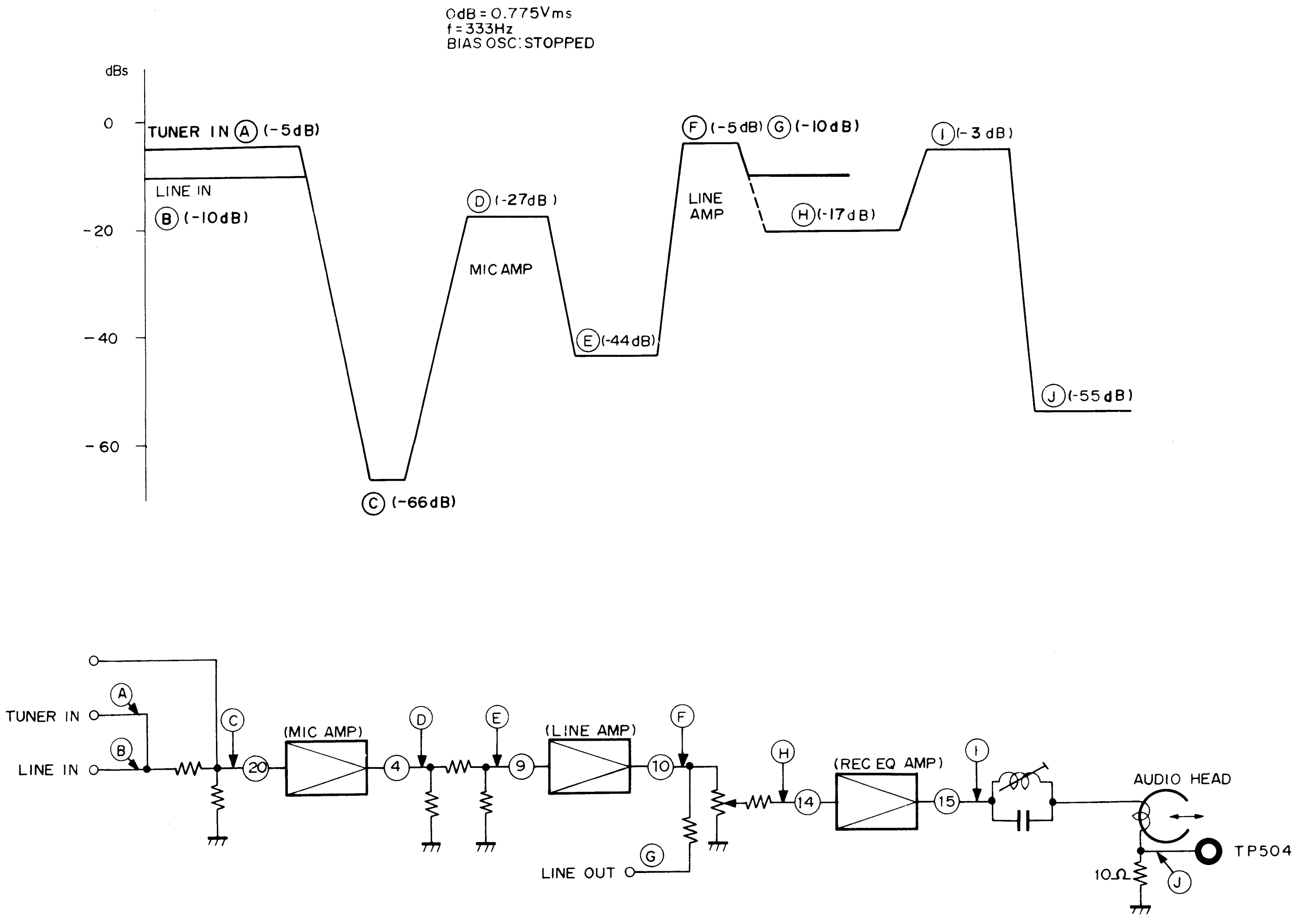
UT 1Vp-p

## AUDIO BLOCK DIAGRAM


TO AUDIO IN
AUDIO SELECT
AUDIO IN
IC502
MUTING CONTROL
Q512
IC501
MIC AMP
ALC CONTROL
AL C CONTROL
LOGIC CONTROL
PB EQ AMP
REC
PB
LINE AMP
REC AMP
MUTING CONTROL
ALC DETECTOR
AUDIO REC/PB HEAD
PB+DUB
EQ
RV502 PB LEVEL
RV503 PBf CHARA
Q503
MUTING CONTROL
Q510
L504
C535
RV501
REC LEVEL
AUDIO SIGNAL
HI CUT CONT
L502
C516
Q507
REC/PB SWITCH
Q505 Q506
REC·PAUSE
CT501 REC BIAS
FULL ERASE HEAD
AUDIO ERASE HEAD
T501
Q504
BIAS/ERASE OSC
Q501, Q502
BIAS/ERASE OSC CONTROL
D502,D503,D504
AUDIO MUTE 1
AUDIO MUTE 2
AUDIO MUTE 3
AUDIO MUTE 4
AM-3 BOARD
BIAS CONT
Main signal channel
:RECORD
:PLAYBACK

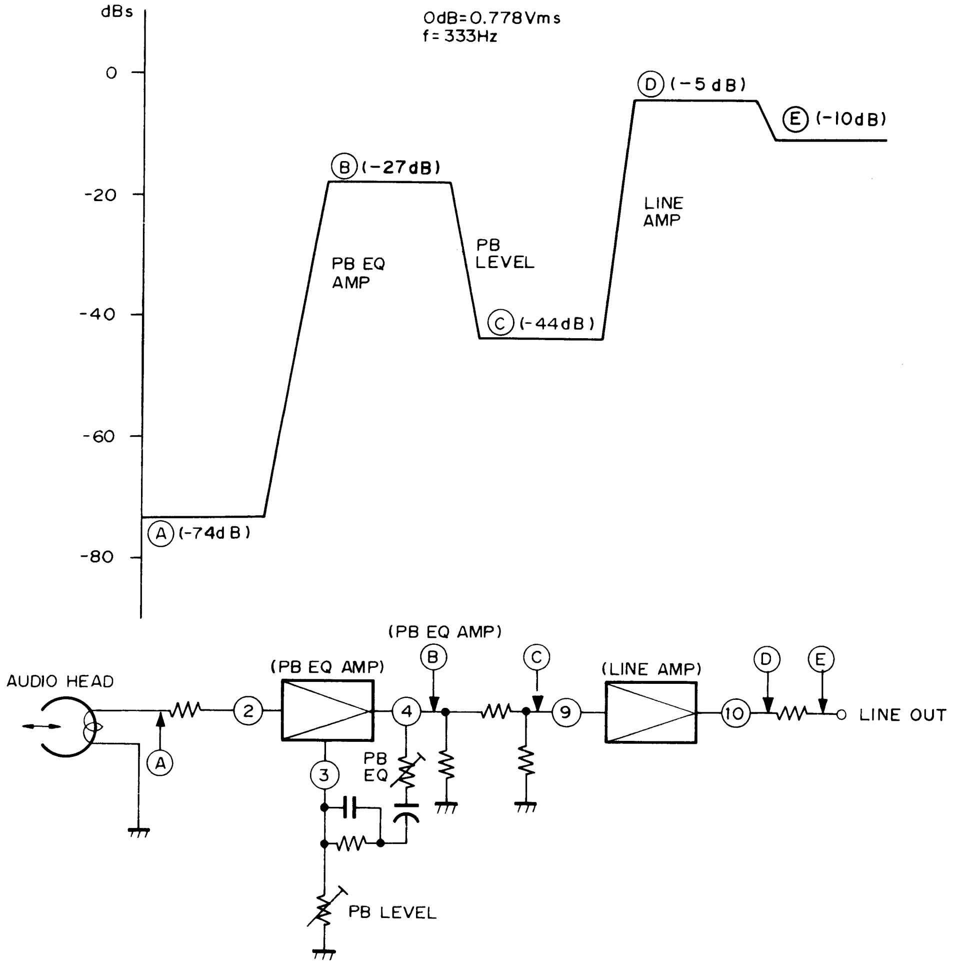
## AUDIO LEVEL DIAGRAM (REC)

### REC MODE

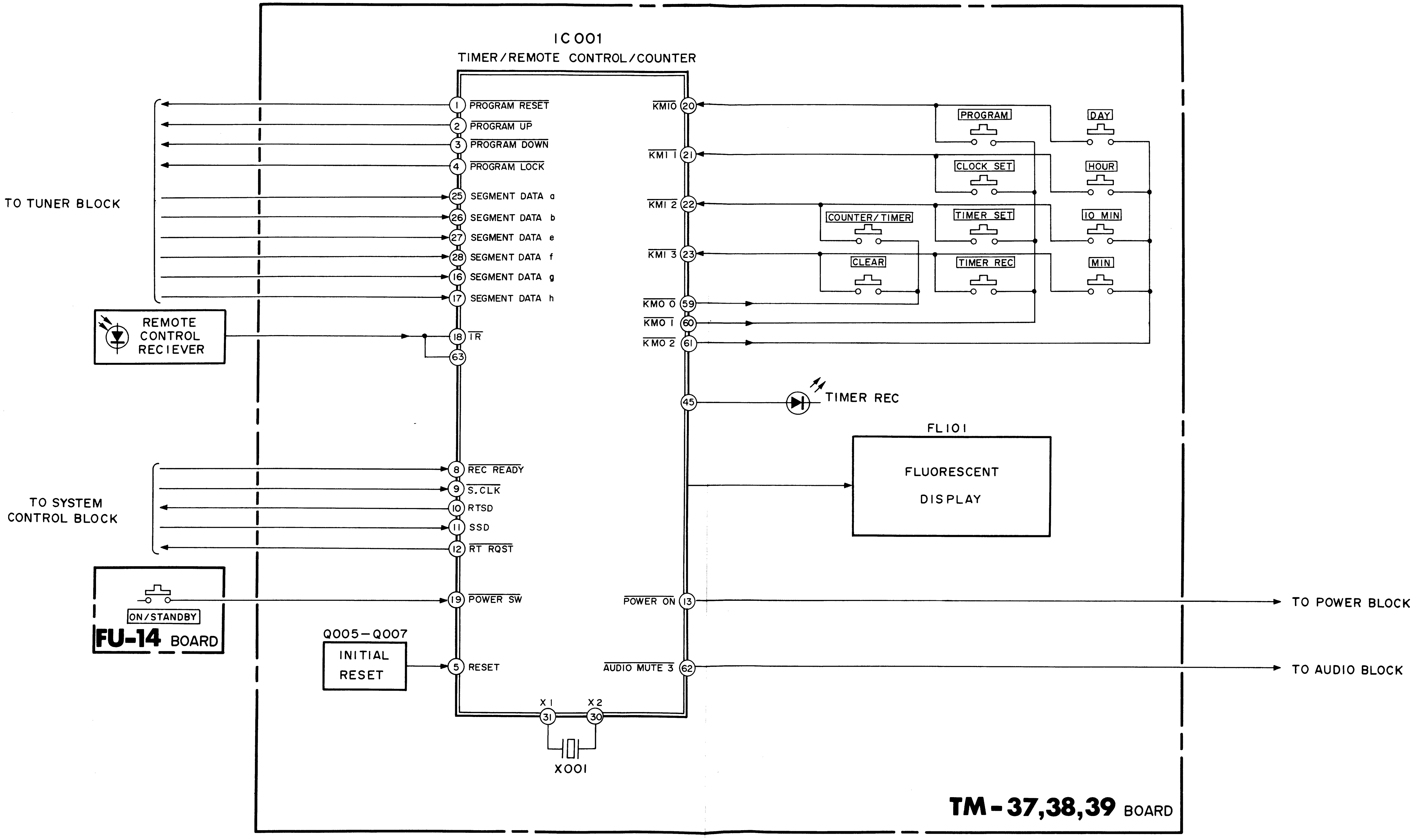

0dB = 0.775Vms
f = 333Hz
BIAS OSC: STOPPED
dBs
0
-20
-40
-60
TUNER IN Ⓐ (-5dB)
LINE IN
Ⓑ (-10dB)
Ⓒ (-66dB)
MIC AMP
Ⓓ (-27dB)
Ⓔ (-44dB)
LINE AMP
Ⓕ (-5dB) Ⓖ (-10dB)
Ⓗ (-17dB)
Ⓘ (-3 dB)
Ⓙ (-55dB)
TUNER IN
LINE IN
Ⓐ
Ⓑ
Ⓒ
⑳
(MIC AMP)
④
Ⓓ
Ⓔ
⑨
(LINE AMP)
⑩
Ⓕ
Ⓖ
LINE OUT
Ⓗ
⑭
(REC EQ AMP)
⑮
Ⓘ
AUDIO HEAD
TP504
10Ω
Ⓙ

## AUDIO LEVEL DIAGRAM (PB)

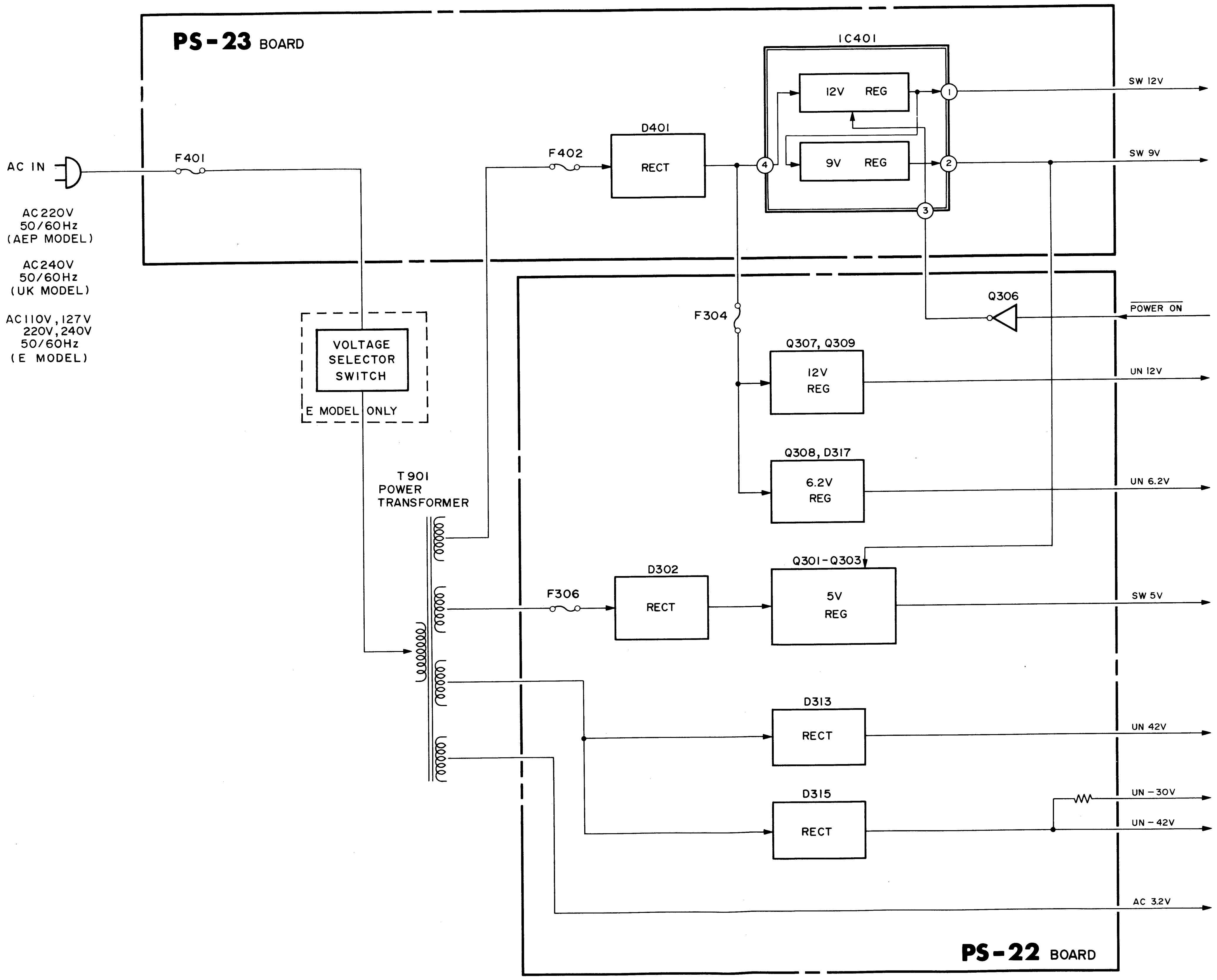
### PB MODE


0dB = 0.778Vms
f = 333Hz
dBs
0
-20
-40
-60
-80
Ⓐ (-74dB)
PB EQ AMP
Ⓑ (-27dB)
PB LEVEL
Ⓒ (-44dB)
LINE AMP
Ⓓ (-5dB)
Ⓔ (-10dB)
AUDIO HEAD
Ⓐ
②
(PB EQ AMP)
③
④
(PB EQ AMP)
Ⓑ
PB EQ
Ⓒ
⑨
(LINE AMP)
⑩
Ⓓ
Ⓔ
LINE OUT
PB LEVEL

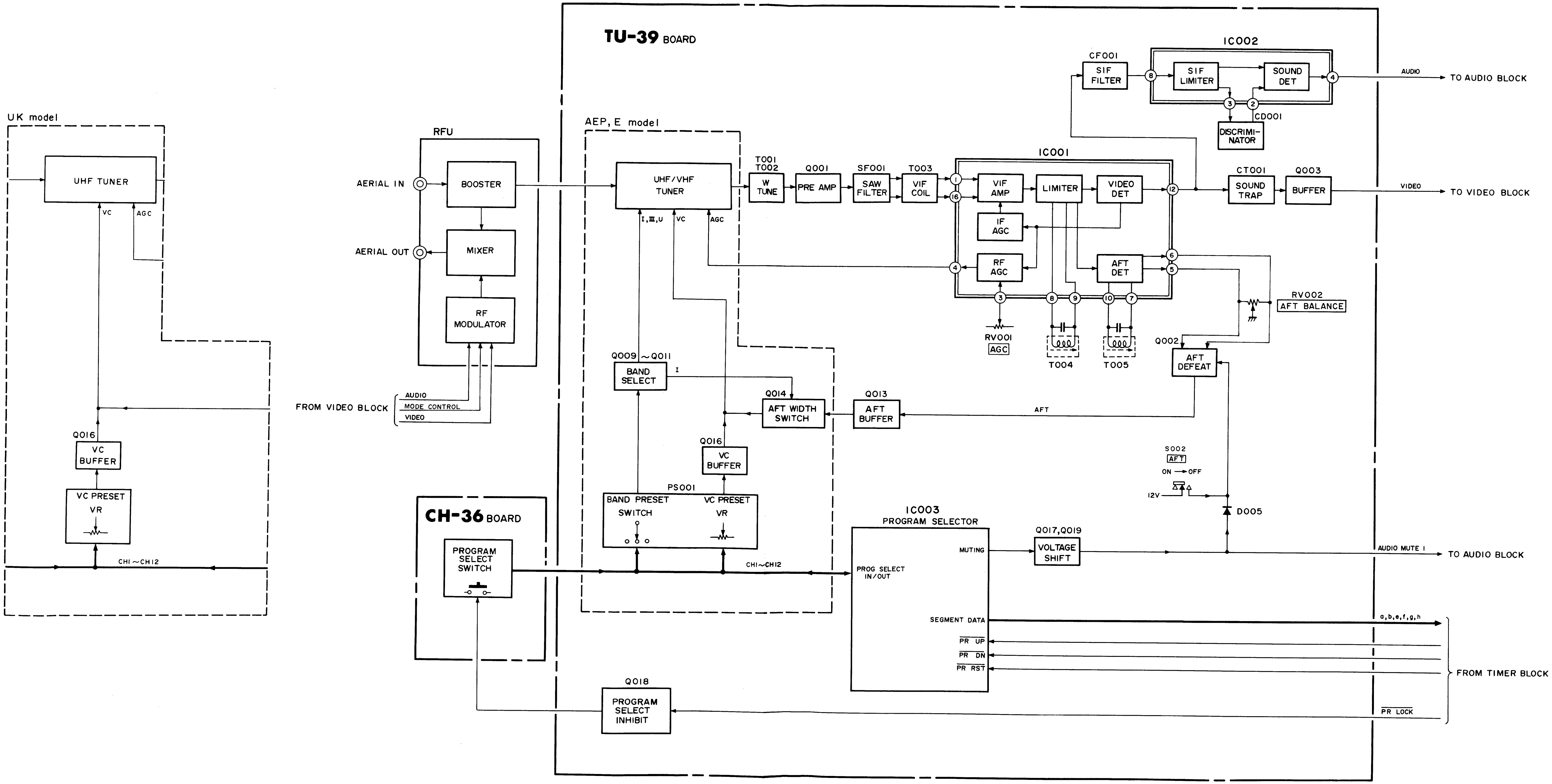
## TIMER BLOCK DIAGRAM


IC001
TIMER/REMOTE CONTROL/COUNTER
1 PROGRAM RESET
2 PROGRAM UP
3 PROGRAM DOWN
4 PROGRAM LOCK
25 SEGMENT DATA a
26 SEGMENT DATA b
27 SEGMENT DATA e
28 SEGMENT DATA f
16 SEGMENT DATA g
17 SEGMENT DATA h
TO TUNER BLOCK
REMOTE CONTROL RECIEVER
18 TR
63
8 REC READY
9 S.CLK
10 RTSD
11 SSD
12 RT RQST
TO SYSTEM CONTROL BLOCK
ON/STANDBY
FU-14 BOARD
19 POWER SW
Q005–Q007
INITIAL RESET
5 RESET
X1
X2
31
30
X001
KMI0 20
KMI 1 21
KMI 2 22
KMI 3 23
KMO 0 59
KMO 1 60
KMO 2 61
PROGRAM
CLOCK SET
TIMER SET
TIMER REC
COUNTER/TIMER
CLEAR
DAY
HOUR
10 MIN
MIN
45
TIMER REC
FL101
FLUORESCENT DISPLAY
POWER ON 13
TO POWER BLOCK
AUDIO MUTE 3 62
TO AUDIO BLOCK
TM-37,38,39 BOARD

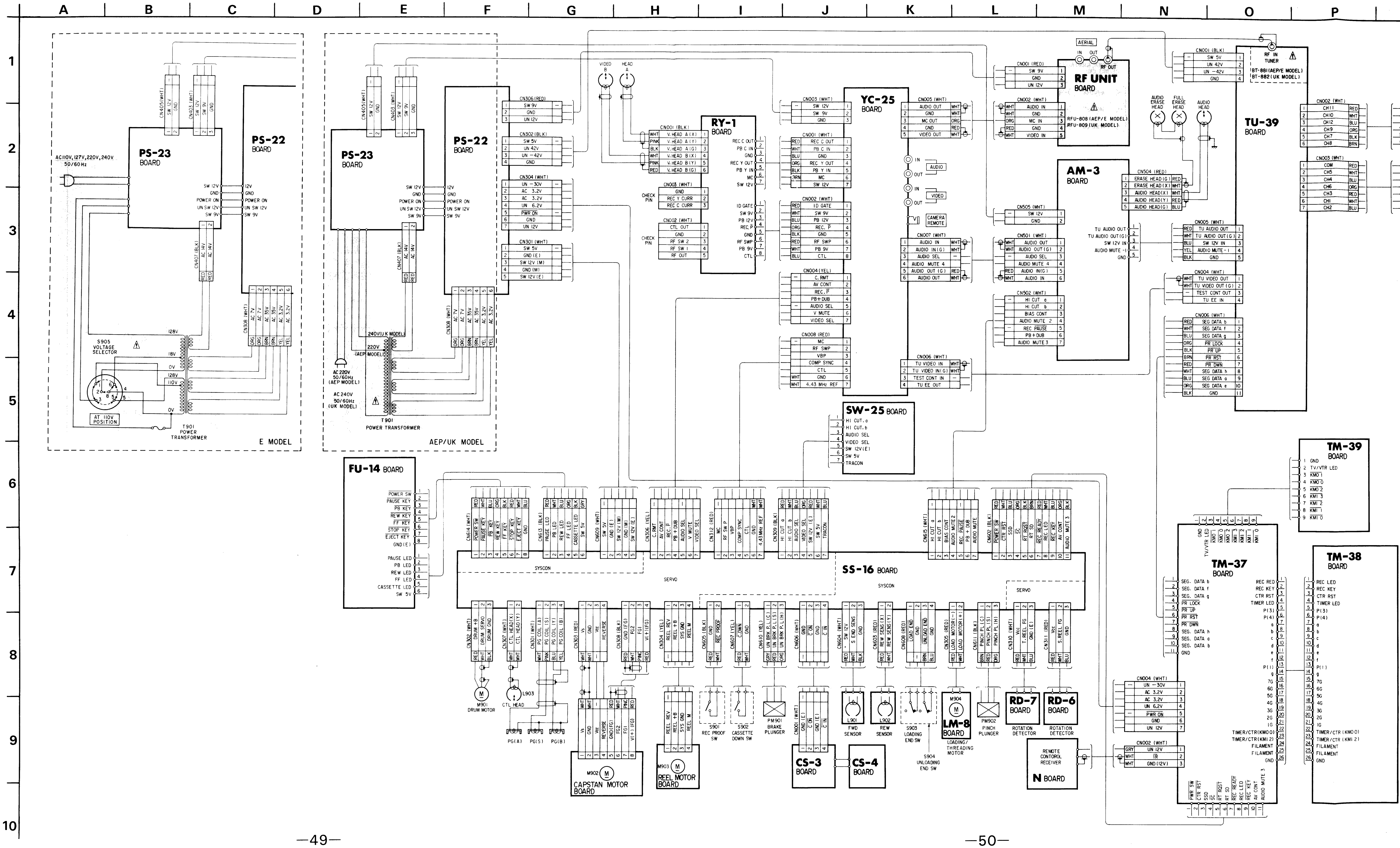
## POWER SUPPLY BLOCK DIAGRAM

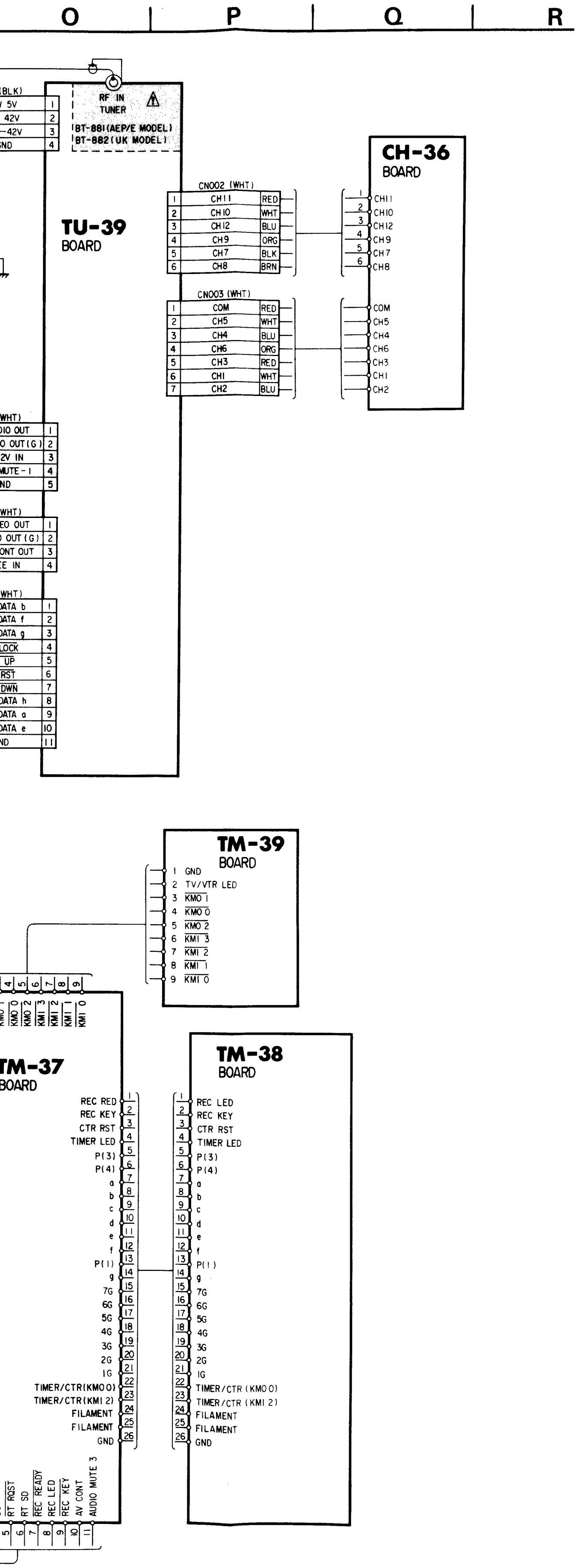

PS-23 BOARD
AC IN
AC220V 50/60Hz (AEP MODEL)
AC240V 50/60Hz (UK MODEL)
AC110V, 127V 220V, 240V 50/60Hz (E MODEL)
F401
F402
D401
RECT
IC401
12V REG
9V REG
SW 12V
SW 9V
VOLTAGE SELECTOR SWITCH
E MODEL ONLY
T901 POWER TRANSFORMER
F304
Q306
POWER ON
Q307, Q309
12V REG
UN 12V
Q308, D317
6.2V REG
UN 6.2V
F306
D302
RECT
Q301-Q303
5V REG
SW 5V
D313
RECT
UN 42V
D315
RECT
UN -30V
UN -42V
AC 3.2V
PS-22 BOARD

## TUNER BLOCK DIAGRAM

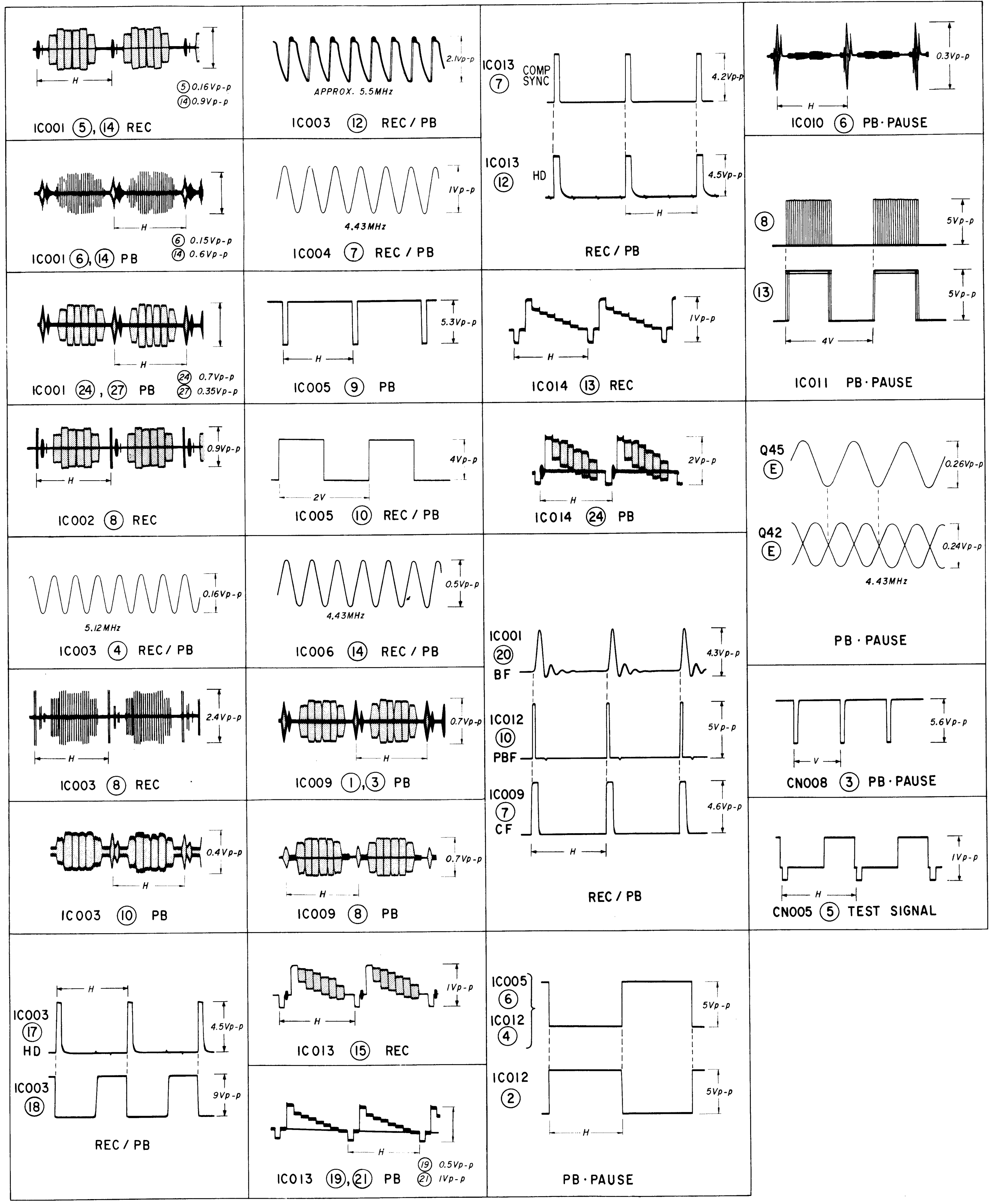

UK model
UHF TUNER
VC
AGC
Q016
VC BUFFER
VC PRESET VR
CH1~CH12
RFU
AERIAL IN
BOOSTER
AERIAL OUT
MIXER
RF MODULATOR
FROM VIDEO BLOCK
AUDIO
MODE CONTROL
VIDEO
CH-36 BOARD
PROGRAM SELECT SWITCH
TU-39 BOARD
AEP, E model
UHF/VHF TUNER
I,III,U
VC
AGC
Q009~Q011
BAND SELECT
I
Q014
AFT WIDTH SWITCH
Q016
VC BUFFER
PS001
BAND PRESET SWITCH
VC PRESET VR
CH1~CH12
Q018
PROGRAM SELECT INHIBIT
T001 T002
W TUNE
Q001
PRE AMP
SF001
SAW FILTER
T003
VIF COIL
IC001
VIF AMP
LIMITER
VIDEO DET
IF AGC
RF AGC
AFT DET
RV001
AGC
T004
T005
CF001
SIF FILTER
IC002
SIF LIMITER
SOUND DET
CD001
DISCRIMI-NATOR
CT001
SOUND TRAP
Q003
BUFFER
AUDIO
TO AUDIO BLOCK
VIDEO
TO VIDEO BLOCK
RV002
AFT BALANCE
Q002
AFT DEFEAT
Q013
AFT BUFFER
AFT
S002
AFT
ON → OFF
12V
D005
IC003
PROGRAM SELECTOR
MUTING
PROG SELECT IN/OUT
SEGMENT DATA
PR UP
PR DN
PR RST
Q017,Q019
VOLTAGE SHIFT
AUDIO MUTE I
TO AUDIO BLOCK
a,b,e,f,g,h
PR LOCK
FROM TIMER BLOCK

## FRAME SCHEMATIC DIAGRAM

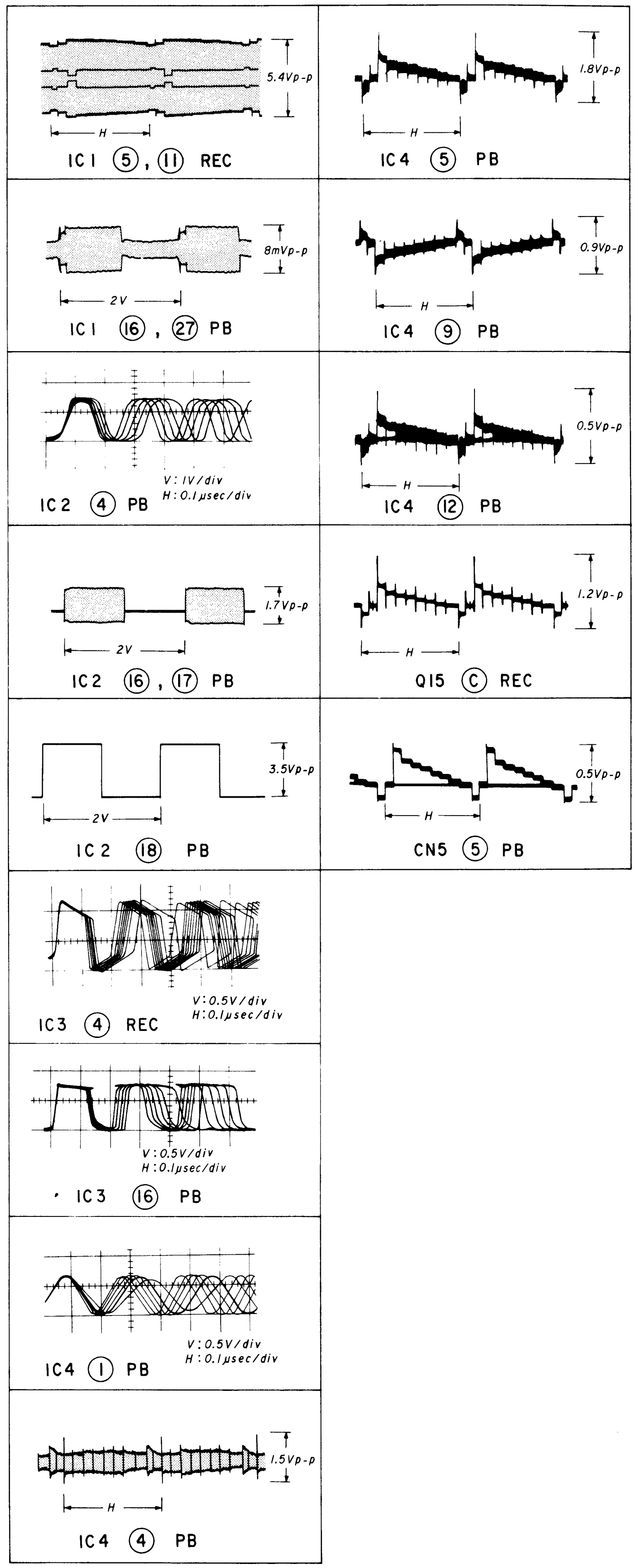

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
1
2
3
4
5
6
7
8
9
10
PS-23 BOARD
PS-22 BOARD
AC110V, 127V, 220V, 240V 50/60Hz
S905 VOLTAGE SELECTOR
AT 110V POSITION
T901 POWER TRANSFORMER
E MODEL
AC 220V 50/60Hz (AEP MODEL)
AC 240V 50/60Hz (UK MODEL)
AEP/UK MODEL
CN405 (WHT)
CN403 (WHT)
CN407 (BLK)
CN308 (WHT)
CN306 (RED)
CN302 (BLK)
CN304 (WHT)
CN301 (WHT)
VIDEO B
HEAD A
RY-1 BOARD
CHECK PIN
YC-25 BOARD
AUDIO
VIDEO
CAMERA REMOTE
SW-25 BOARD
AERIAL
IN
OUT
RF OUT
RF UNIT BOARD
RFU-808 (AEP/E MODEL)
RFU-809 (UK MODEL)
AM-3 BOARD
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO HEAD
RF IN TUNER
BT-881 (AEP/E MODEL)
BT-882 (UK MODEL)
TU-39 BOARD
TM-39 BOARD
FU-14 BOARD
SS-16 BOARD
SYSCON
SERVO
TM-37 BOARD
TM-38 BOARD
M901 DRUM MOTOR
L903 CTL HEAD
PG(A)
PG(S)
PG(B)
M902 CAPSTAN MOTOR BOARD
M903 REEL MOTOR BOARD
S901 REC PROOF SW
S902 CASSETTE DOWN SW
PM901 BRAKE PLUNGER
CS-3 BOARD
CS-4 BOARD
L901 FWD SENSOR
L902 REW SENSOR
S903 LOADING END SW
S904 UNLOADING END SW
M904
LM-8 BOARD
LOADING/THREADING MOTOR
PM902 PINCH PLUNGER
RD-7 BOARD
ROTATION DETECTOR
RD-6 BOARD
ROTATION DETECTOR
REMOTE CONTOROL RECEIVER
N BOARD


O
P
Q
R
RF IN
TUNER
BT-881(AEP/E MODEL)
BT-882(UK MODEL)
(BLK)
5V 1
42V 2
−42V 3
GND 4
TU-39
BOARD
CN002 (WHT)
1 CH11 RED
2 CH10 WHT
3 CH12 BLU
4 CH9 ORG
5 CH7 BLK
6 CH8 BRN
CN003 (WHT)
1 COM RED
2 CH5 WHT
3 CH4 BLU
4 CH6 ORG
5 CH3 RED
6 CH1 WHT
7 CH2 BLU
CH-36
BOARD
1 CH11
2 CH10
3 CH12
4 CH9
5 CH7
6 CH8
COM
CH5
CH4
CH6
CH3
CH1
CH2
(WHT)
DIO OUT 1
O OUT(G) 2
2V IN 3
MUTE-1 4
ND 5
(WHT)
EO OUT 1
O OUT(G) 2
ONT OUT 3
E IN 4
(WHT)
DATA b 1
DATA f 2
DATA g 3
LOCK 4
UP 5
RST 6
DWN 7
DATA h 8
DATA a 9
DATA e 10
ND 11
TM-39
BOARD
1 GND
2 TV/VTR LED
3 KMO 1
4 KMO 0
5 KMO 2
6 KMI 3
7 KMI 2
8 KMI 1
9 KMI 0
TM-37
BOARD
KMO 0
KMO 2
KMI 3
KMI 2
KMI 1
KMI 0
REC RED 1
REC KEY 2
CTR RST 3
TIMER LED 4
P(3) 5
P(4) 6
a 7
b 8
c 9
d 10
e 11
f 12
P(1) 13
g 14
7G 15
6G 16
5G 17
4G 18
3G 19
2G 20
1G 21
TIMER/CTR(KMO0) 22
TIMER/CTR(KMI2) 23
FILAMENT 24
FILAMENT 25
GND 26
TM-38
BOARD
1 REC LED
2 REC KEY
3 CTR RST
4 TIMER LED
5 P(3)
6 P(4)
7 a
8 b
9 c
10 d
11 e
12 f
13 P(1)
14 g
15 7G
16 6G
17 5G
18 4G
19 3G
20 2G
21 1G
22 TIMER/CTR (KMO0)
23 TIMER/CTR (KMI2)
24 FILAMENT
25 FILAMENT
26 GND
RT RQST 5
RT SD 6
REC READY 7
REC LED 8
REC KEY 9
AV CONT 10
AUDIO MUTE 3 11

YC-25 BOARD



RY-1 BOARD

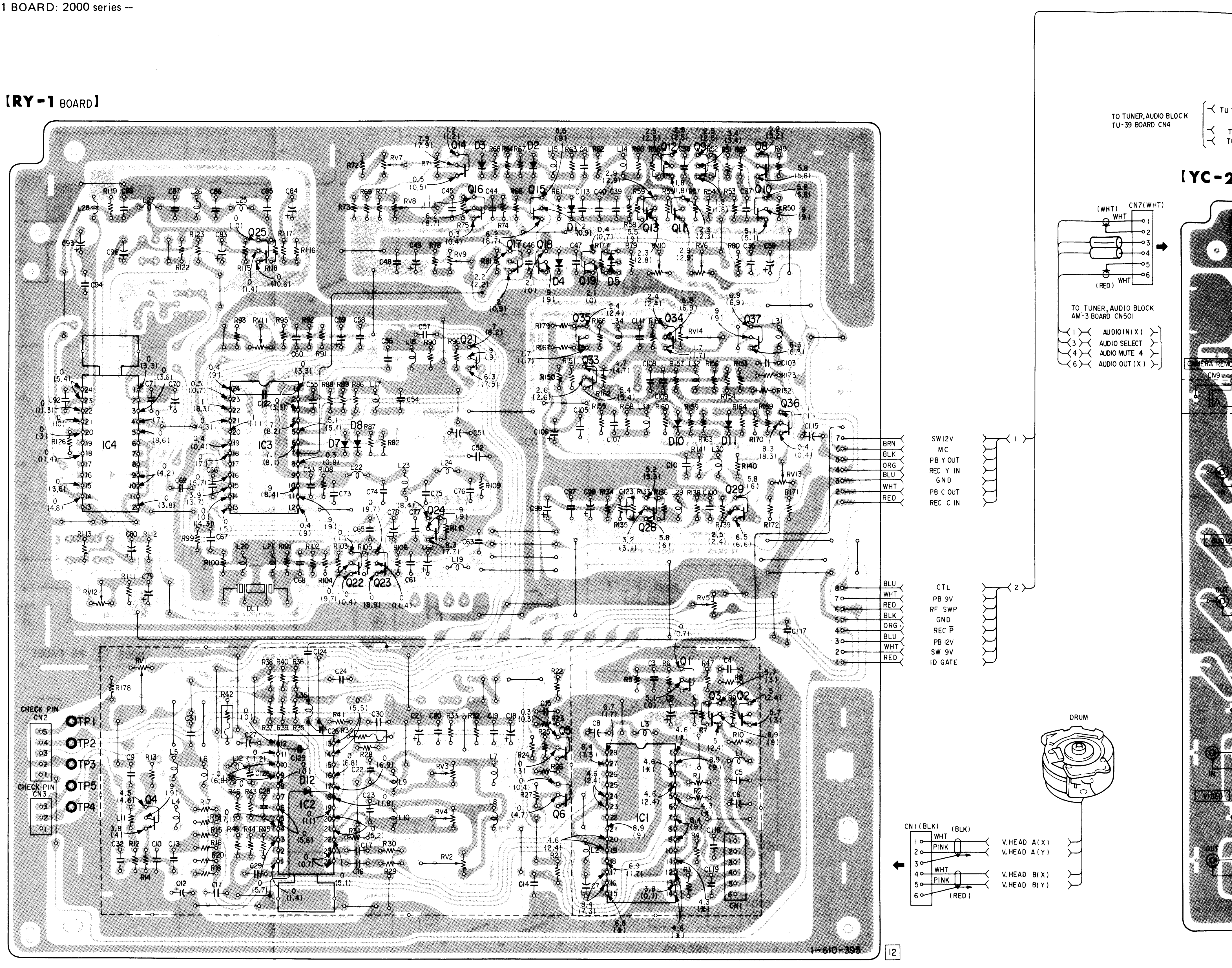


**YC-25** (Y & CHROMA SIGNALS RECORD/PLAYBACK PROCESS) **RY-1** (LOW CONVERTED CHROMA & Y-FM SIGNALS, RECORD/PLAYBACK AMP)

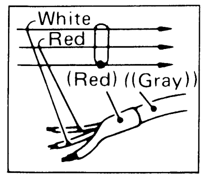
– Ref. No. YC-25 BOARD: 1000 series, RY-1 BOARD: 2000 series –

| | IC·Q | D | RV·TP |
|---|---|---|---|
| 1 | | | |
| 2 | 14 12 9 8<br>16 15 13,11 10 | 3,2 | RV7 |
| 3 | 25 17,18 19 | 1<br>4,5 | RV8<br>RV10,RV6<br>RV9 |
| 4 | 35 34 37<br>33<br>21 | | RV14<br>RV11 |
| 5 | 36<br>IC4 IC3<br>28 29 | 10 11<br>7,8 | RV13 |
| 6 | 24<br>22 23 | | RV12 RV5 |
| 7 | 1<br>3,2<br>5 | | RV1<br>1 |
| 8 | 6<br>IC2 IC1<br>4 | 12 | 2<br>3<br>RV3<br>5<br>4<br>RV4 |
| 9 | | | RV2 |

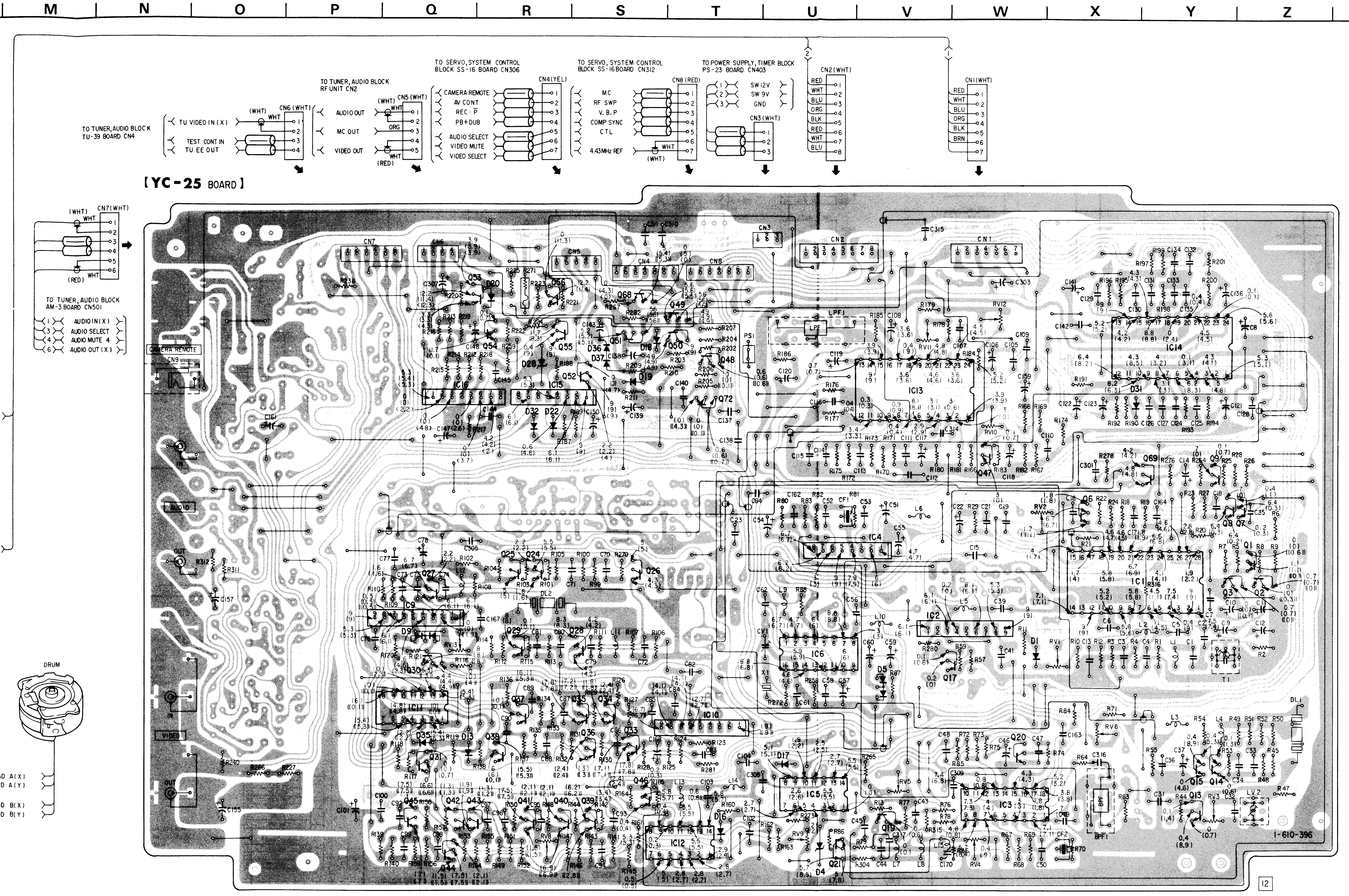
**[RY-1 BOARD]**

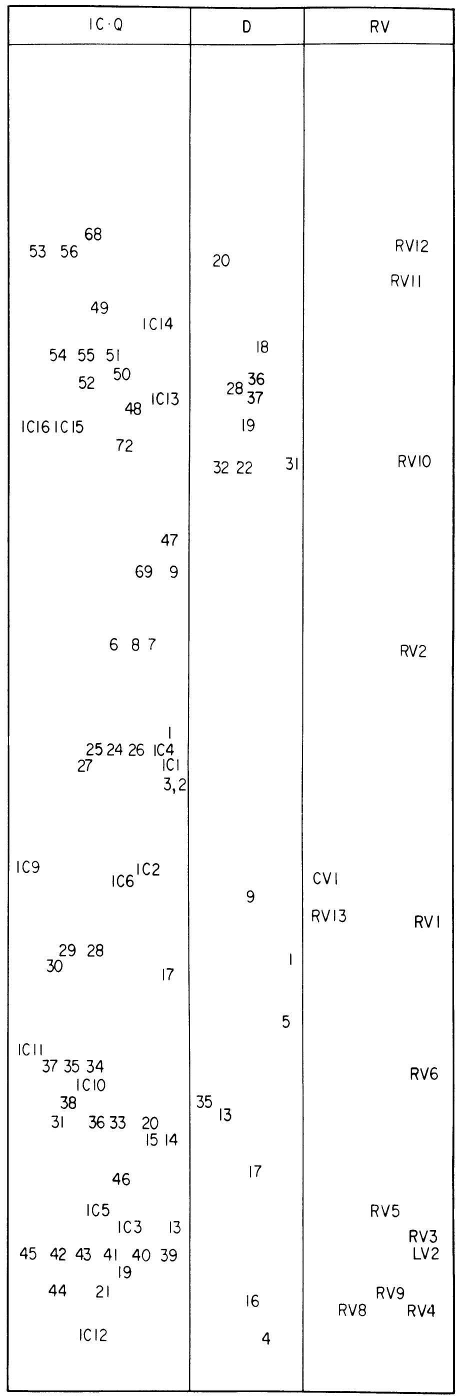

A
B
C
D
E
F
G
H
I
J
K
L
M
N
1-610-395
12
CHECK PIN CN2
CHECK PIN CN3
TP1
TP2
TP3
TP5
TP4
IC1
IC2
IC3
IC4
DL1
BRN
BLK
ORG
BLU
WHT
RED
SW12V
MC
PB Y OUT
REC Y IN
GND
PB C OUT
REC C IN
CTL
PB 9V
RF SWP
GND
REC P̄
PB 12V
SW 9V
ID GATE
TO TUNER, AUDIO BLOCK TU-39 BOARD CN4
(WHT) CN7(WHT)
WHT
(RED)
TO TUNER, AUDIO BLOCK AM-3 BOARD CN501
AUDIO IN (X)
AUDIO SELECT
AUDIO MUTE 4
AUDIO OUT (X)
CAMERA REMO
CN9
[YC-2
VIDEO
DRUM
CN1(BLK) (BLK)
WHT
PINK
(RED)
V.HEAD A(X)
V.HEAD A(Y)
V.HEAD B(X)
V.HEAD B(Y)

- Color code of sleeving over the end of the jacket.


White
Red
(Red) ((Gray))

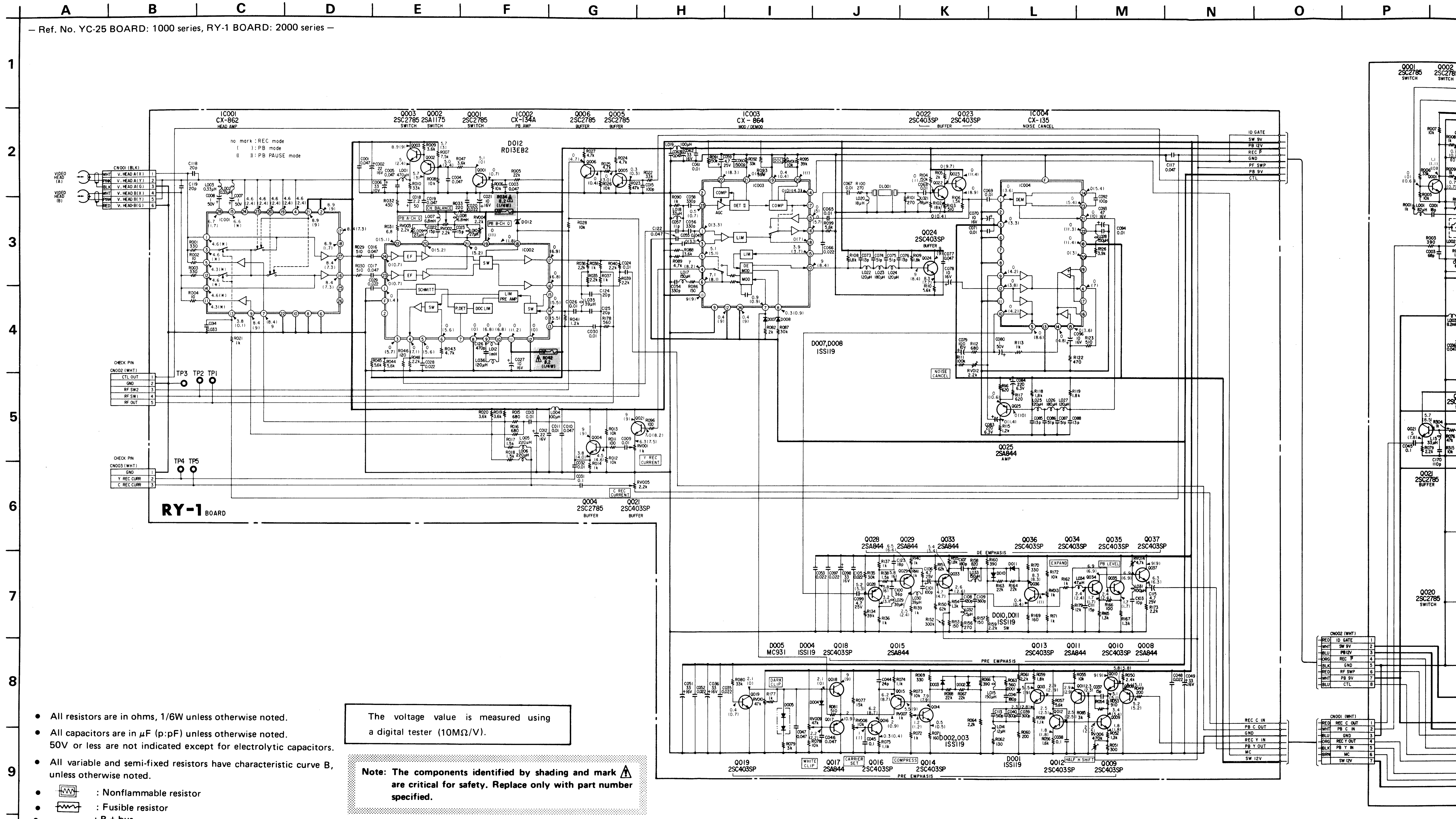
- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- ▨ Soldering side
- ░ B + pattern


M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
A1
B1
TO TUNER, AUDIO BLOCK TU-39 BOARD CN4
TU VIDEO IN (X)
TEST CONT IN
TU EE OUT
CN6 (WHT)
(WHT)
WHT
TO TUNER, AUDIO BLOCK RF UNIT CN2
AUDIO OUT
MC OUT
VIDEO OUT
CN5 (WHT)
ORG
(RED)
TO SERVO, SYSTEM CONTROL BLOCK SS-16 BOARD CN306
CAMERA REMOTE
AV CONT
REC · P̄
PB+DUB
AUDIO SELECT
VIDEO MUTE
VIDEO SELECT
CN4 (YEL)
TO SERVO, SYSTEM CONTROL BLOCK SS-16 BOARD CN312
MC
RF SWP
V. B. P
COMP SYNC
CTL
4.43MHz REF
CN8 (RED)
TO POWER SUPPLY, TIMER BLOCK PS-23 BOARD CN403
SW 12V
SW 9V
GND
CN3 (WHT)
CN2 (WHT)
CN1 (WHT)
RED
WHT
BLU
ORG
BLK
BRN
【YC-25 BOARD】
CN7 (WHT)
TO TUNER, AUDIO BLOCK AM-3 BOARD CN501
AUDIO IN (X)
AUDIO SELECT
AUDIO MUTE 4
AUDIO OUT (X)
CAMERA REMOTE
CN9
IN
AUDIO
OUT
VIDEO
DRUM
D A(X)
D A(Y)
D B(X)
D B(Y)
IC1
IC2
IC3
IC4
IC5
IC6
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
LPF1
BPF1
CF1
CF2
DL1
DL2
T1
X1
PS1
1-610-396
12


IC·Q
D
RV
68
53 56
20
RV12
RV11
49
IC14
18
54 55 51
50
52
28 36 37
IC13
48
IC16 IC15
19
72
32 22
31
RV10
47
69 9
6 8 7
RV2
1
25 24 26 IC4
27
IC1
3,2
IC9
IC6 IC2
CV1
9
RV13
RV1
29 28
30
1
17
5
IC11
37 35 34
IC10
RV6
38
35
13
31
36 33
20
15 14
17
46
IC5
RV5
IC3
13
RV3
LV2
45 42 43 41 40 39
19
RV9
44 21
16
RV8
RV4
IC12
4

## YC-25 (Y & CHROMA SIGNALS RECORD/PLAYBACK PROCESS) RY-1 (LOW CONVERTED CHROMA & Y-FM SIGNALS, RECORD/PLAYBACK AMP)

– Ref. No. YC-25 BOARD: 1000 series, RY-1 BOARD: 2000 series –

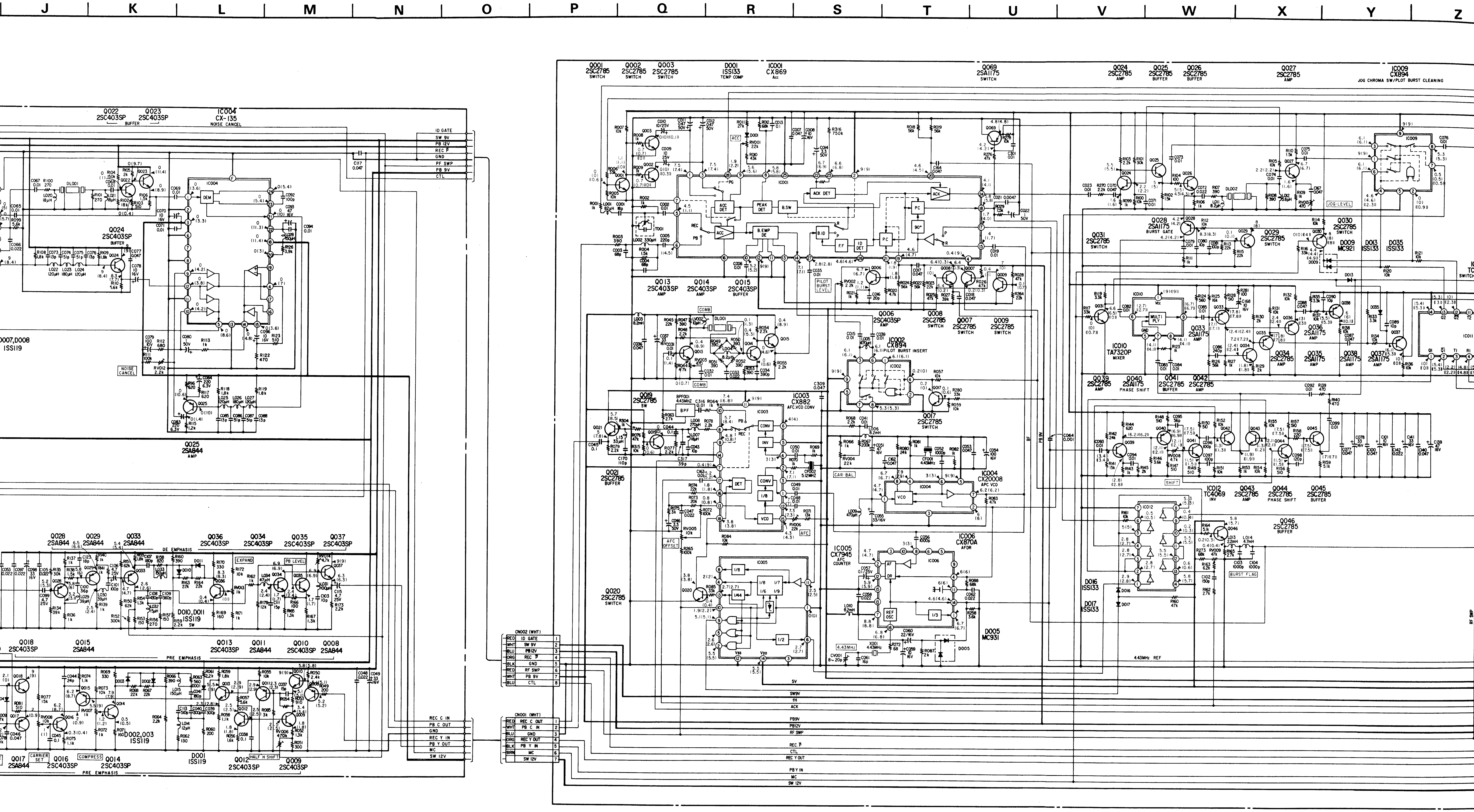

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
1
2
3
4
5
6
7
8
9
10
IC001 CX-862 HEAD AMP
Q003 2SC2785 SWITCH
Q002 2SA1175 SWITCH
Q001 2SC2785 SWITCH
IC002 CX-134A PB AMP
Q006 2SC2785 BUFFER
Q005 2SC2785 BUFFER
IC003 CX-864 MOD / DEMOD
Q022 2SC403SP
Q023 2SC403SP
BUFFER
IC004 CX-135 NOISE CANCEL
D012 RD13EB2
no mark : REC mode
( ) : PB mode
(( )) : PB PAUSE mode
VIDEO HEAD (A)
VIDEO HEAD (B)
CN001 (BLK)
V. HEAD A(X)
V. HEAD A(Y)
V. HEAD A(G)
V. HEAD B(X)
V. HEAD B(Y)
V. HEAD B(G)
PB A-CH Q
CH BALANCE
PB B-CH Q
EF
SW
SCHMITT
P.DET
DOC LIM
LIM PRE AMP
COMP
DET
AGC
LIM
DE MOD
MOD
DEM
Q024 2SC403SP BUFFER
D007,D008 1SS119
NOISE CANCEL
Q025 2SA844 AMP
CHECK PIN
CN002 (WHT)
CTL OUT
GND
RF SW2
RF SW1
RF OUT
TP3
TP2
TP1
CN003 (WHT)
Y REC CURR
C REC CURR
TP4
TP5
Y REC CURRENT
C REC CURRENT
Q004 2SC2785 BUFFER
Q021 2SC403SP BUFFER
RY-1 BOARD
ID GATE
SW 9V
PB 12V
REC P
GND
PF SWP
PB 9V
CTL
Q028 2SA844
Q029 2SA844
Q033 2SA844
Q036 2SC403SP
Q034 2SC403SP
Q035 2SC403SP
Q037 2SC403SP
DE EMPHASIS
EXPAND
PB LEVEL
D010,D011 1SS119 SW
D005 MC931
D004 1SS119
Q018 2SC403SP
Q015 2SA844
Q013 2SC403SP
Q011 2SA844
Q010 2SC403SP
Q008 2SA844
PRE EMPHASIS
DARK CLIP
WHITE CLIP
CARRIER SET
COMPRESS
HALF H SHIFT
Q019 2SC403SP
Q017 2SA844
Q016 2SC403SP
Q014 2SC403SP
D002,003 1SS119
D001 1SS119
Q012 2SC403SP
Q009 2SC403SP
REC C IN
PB C OUT
GND
REC Y IN
PB Y OUT
MC
SW 12V
CN002 (WHT)
CN001 (WHT)
REC C OUT
PB C IN
REC Y OUT
PB Y IN
Q001 2SC2785 SWITCH
Q002 2SC2785 SWITCH
Q021 2SC2785 BUFFER
Q020 2SC2785 SWITCH

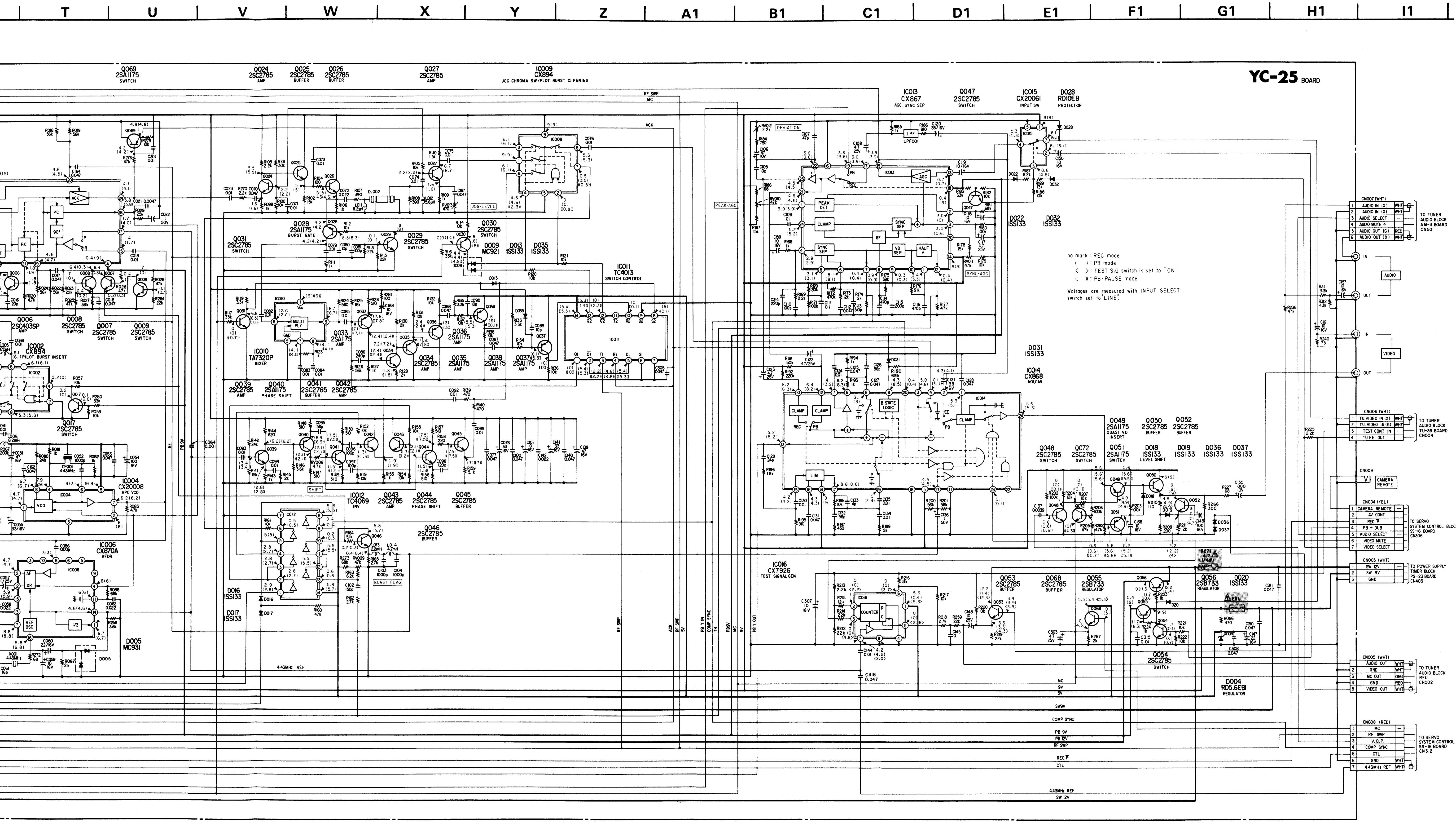
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : Nonflammable resistor
- ▭ : Fusible resistor
- —— : B + bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

The voltage value is measured using a digital tester (10MΩ/V).

**Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

When indicating parts by reference number, please include the board name.

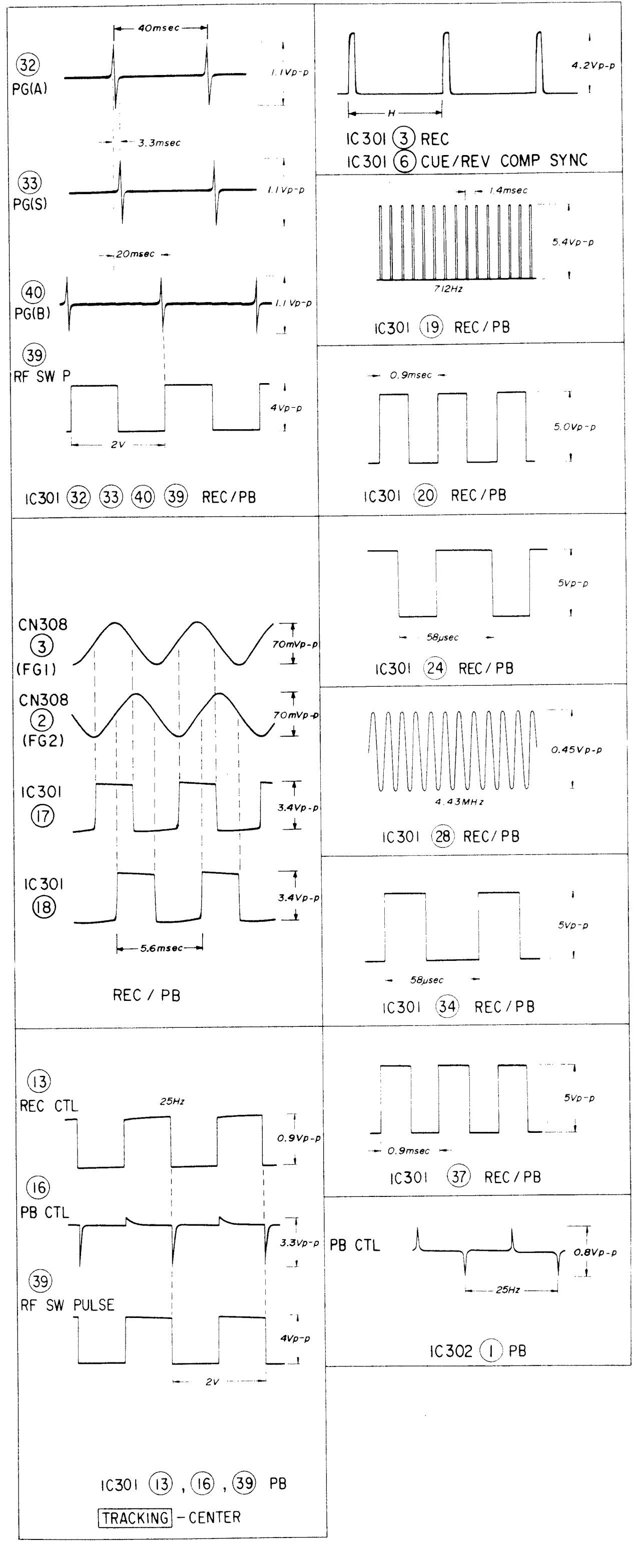

J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
Q022 2SC403SP
Q023 2SC403SP
BUFFER
IC004 CX-135
NOISE CANCEL
Q024 2SC403SP BUFFER
Q025 2SA844 AMP
NOISE CANCEL
D007,D008 ISS119
ID GATE
SW 9V
PB 12V
REC P
GND
PF SWP
PB 9V
CTL
Q028 2SA844
Q029 2SA844
Q033 2SA844
Q036 2SC403SP
Q034 2SC403SP
Q035 2SC403SP
Q037 2SC403SP
DE EMPHASIS
EXPAND
PB LEVEL
D010,D011 ISS119 SW
Q018 2SC403SP
Q015 2SA844
Q013 2SC403SP
Q011 2SA844
Q010 2SC403SP
Q008 2SA844
PRE EMPHASIS
D002,003 ISS119
D001 ISS119
Q017 2SA844
CARRIER SET
Q016 2SC403SP
COMPRESS
Q014 2SC403SP
Q012 2SC403SP
HALF H SHIFT
Q009 2SC403SP
REC C IN
PB C OUT
GND
REC Y IN
PB Y OUT
MC
SW 12V
CN002 (WHT)
CN001 (WHT)
Q001 2SC2785 SWITCH
Q002 2SC2785 SWITCH
Q003 2SC2785 SWITCH
D001 ISS133 TEMP COMP
IC001 CX869 Acc
Q069 2SA1175 SWITCH
Q024 2SC2785 AMP
Q025 2SC2785 BUFFER
Q026 2SC2785 BUFFER
Q027 2SC2785 AMP
IC009 CX894 JOG CHROMA SW/PLOT BURST CLEANING
ACC
ACC DET
PEAK DET
B.SW
ACK DET
ACK
B.EMP DE
B.ID
F.F
ID DET
PC
90°
PILOT BURST LEVEL
Q013 2SC403SP AMP
Q014 2SC403SP AMP
Q015 2SC403SP BUFFER
Q006 2SC403SP AMP
Q008 2SC2785 SWITCH
Q007 2SC2785 SWITCH
Q009 2SC2785 SWITCH
COMB
IC002 CX894 PILOT BURST INSERT
Q019 2SC2785 SW
BPF
IC003 CX882 AFC.VCO.CONV
Q017 2SC2785 SWITCH
CONV
INV
DET
1/8
VCO
CAR.BAL
IC004 CX20008 APC VCO
Q021 2SC2785 BUFFER
AFC OFFSET
AFC
IC005 CX7945 AFC COUNTER
IC006 CX870A AFDR
Q020 2SC2785 SWITCH
REF OSC
D005 MC931
4.43MHz
Q028 2SA1175 BURST GATE
Q029 2SC2785 SWITCH
Q030 2SC2785 SWITCH
Q031 2SC2785 SWITCH
D009 MC921
D013 ISS133
D035 ISS133
JOG LEVEL
IC010 TA7320P MIXER
MULTI PLY
Q033 2SA1175 AMP
Q034 2SA1175 AMP
Q035 2SA1175 AMP
Q036 2SA1175 AMP
Q037 2SA1175 AMP
Q038 2SA1175 AMP
Q039 2SC2785 AMP
Q040 2SA1175 PHASE SHIFT
Q041 2SC2785 BUFFER
Q042 2SC2785 AMP
SHIFT
IC012 TC4069 INV
Q043 2SC2785 AMP
Q044 2SC2785 PHASE SHIFT
Q045 2SC2785 BUFFER
Q046 2SC2785 BUFFER
BURST FLAG
D016 ISS133
D017 ISS133
4.43MHz REF
5V
SW9V
ACK
PB9V
PB12V
RF SWP
REC P
CTL
REC Y OUT
PB Y IN
MC
SW 12V


T
U
V
W
X
Y
Z
A1
B1
C1
D1
E1
F1
G1
H1
I1
YC-25 BOARD
Q069 2SA1175 SWITCH
Q024 2SC2785 AMP
Q025 2SC2785 BUFFER
Q026 2SC2785 BUFFER
Q027 2SC2785 AMP
IC009 CX894 JOG CHROMA SW/PILOT BURST CLEANING
Q028 2SA1175 BURST GATE
Q029 2SC2785 SWITCH
Q030 2SC2785 SWITCH
D009 MC921
D013 1SS133
D035 1SS133
Q031 2SC2785 SWITCH
IC011 TC4013 SWITCH CONTROL
Q006 2SC403SP AMP
Q008 2SC2785 SWITCH
Q007 2SC2785 SWITCH
Q009 2SC2785 SWITCH
IC002 CX894 PILOT BURST INSERT
Q017 2SC2785 SWITCH
IC010 TA7320P MIXER
Q033 2SA1175 AMP
Q036 2SA1175 AMP
Q034 2SC2785 AMP
Q035 2SA1175 AMP
Q038 2SA1175 AMP
Q037 2SA1175 AMP
Q039 2SC2785 AMP
Q040 2SA1175 PHASE SHIFT
Q041 2SC2785 BUFFER
Q042 2SC2785 AMP
JOG-LEVEL
SHIFT
IC004 CX20008 APC VCO
VCO
IC006 CX870A AFDR
AF
DR
REF OSC
1/3
D005 MC931
IC012 TC4069 INV
Q043 2SC2785 AMP
Q044 2SC2785 PHASE SHIFT
Q045 2SC2785 BUFFER
Q046 2SC2785 BUFFER
BURST FLAG
D016 1SS133
D017 1SS133
4.43MHz REF
RF SWP
MC
ACK
IC013 CX867 AGC, SYNC SEP
Q047 2SC2785 SWITCH
IC015 CX20061 INPUT SW
D028 RD10EB PROTECTION
DEVIATION
PEAK-AGC
SYNC-AGC
LPF001
LPF
PEAK DET
CLAMP
SYNC SEP
AGC
BF
VD SEP
HALF H
D022 1SS133
D032 1SS133
D031 1SS133
IC014 CX868 NOI.CAN
B STATE LOGIC
LIM
Q049 2SA1175 QUASI VD INSERT
Q050 2SC2785 BUFFER
Q052 2SC2785 BUFFER
Q048 2SC2785 SWITCH
Q072 2SC2785 SWITCH
Q051 2SA1175 SWITCH
D018 1SS133 LEVEL SHIFT
D019 1SS133
D036 1SS133
D037 1SS133
IC016 CX7926 TEST SIGNAL GEN
COUNTER
Q053 2SC2785 BUFFER
Q068 2SC2785 BUFFER
Q055 2SB733 REGULATOR
Q056 2SB733 REGULATOR
D020 1SS133
R271 4.7 (1/4W)
PS1
Q054 2SC2785 SWITCH
D004 RD5.6EB1 REGULATOR
CN007 (WHT)
1 AUDIO IN (X) WHT
2 AUDIO IN (G) WHT
3 AUDIO SELECT —
4 AUDIO MUTE 4
5 AUDIO OUT (G) RED
6 AUDIO OUT (X) WHT
TO TUNER AUDIO BLOCK AM-3 BOARD CN501
IN
AUDIO
OUT
IN
VIDEO
OUT
CN006 (WHT)
1 TU.VIDEO IN (X) WHT
2 TU.VIDEO IN (G) WHT
3 TEST CONT IN —
4 TU.EE. OUT
TO TUNER AUDIO BLOCK TU-39 BOARD CN004
CN009
CAMERA REMOTE
CN004 (YEL)
1 CAMERA REMOTE —
2 AV CONT
3 REC.P̄
4 PB + DUB
5 AUDIO SELECT —
6 VIDEO MUTE
7 VIDEO SELECT
TO SERVO SYSTEM CONTROL BLOCK SS-16 BOARD CN306
CN003 (WHT)
1 SW 12V —
2 SW 9V
3 GND
TO POWER SUPPLY TIMER BLOCK PS-23 BOARD CN403
CN005 (WHT)
1 AUDIO OUT WHT
2 GND WHT
3 MC OUT ORG
4 GND RED
5 VIDEO OUT WHT
TO TUNER AUDIO BLOCK RFU CN002
CN008 (RED)
1 MC —
2 RF SWP
3 V.B.P.
4 COMP SYNC
5 CTL
6 GND WHT
7 4.43MHz REF WHT
TO SERVO SYSTEM CONTROL BLOCK SS-16 BOARD CN312
MC
9V
5V
SW9V
COMP SYNC
PB 9V
PB 12V
RF SWP
REC P̄
CTL
4.43MHz REF
SW 12V

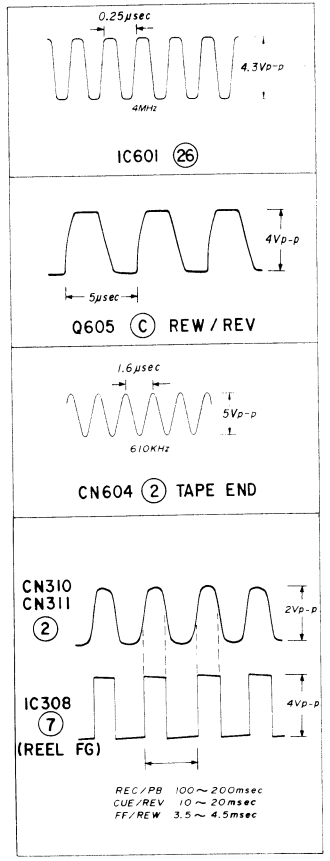
no mark : REC mode
( ) : PB mode
< > : TEST SIG switch is set to "ON"
(( )) : PB·PAUSE mode

Voltages are measured with INPUT SELECT switch set to "LINE".

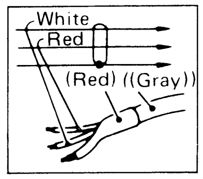
SS-16 (SERVO) BOARD



SS-16 (SYSTEM CONTROL) BOARD



- Color code of sleeving over the end of the jacket.


White
Red
(Red) ((Gray))

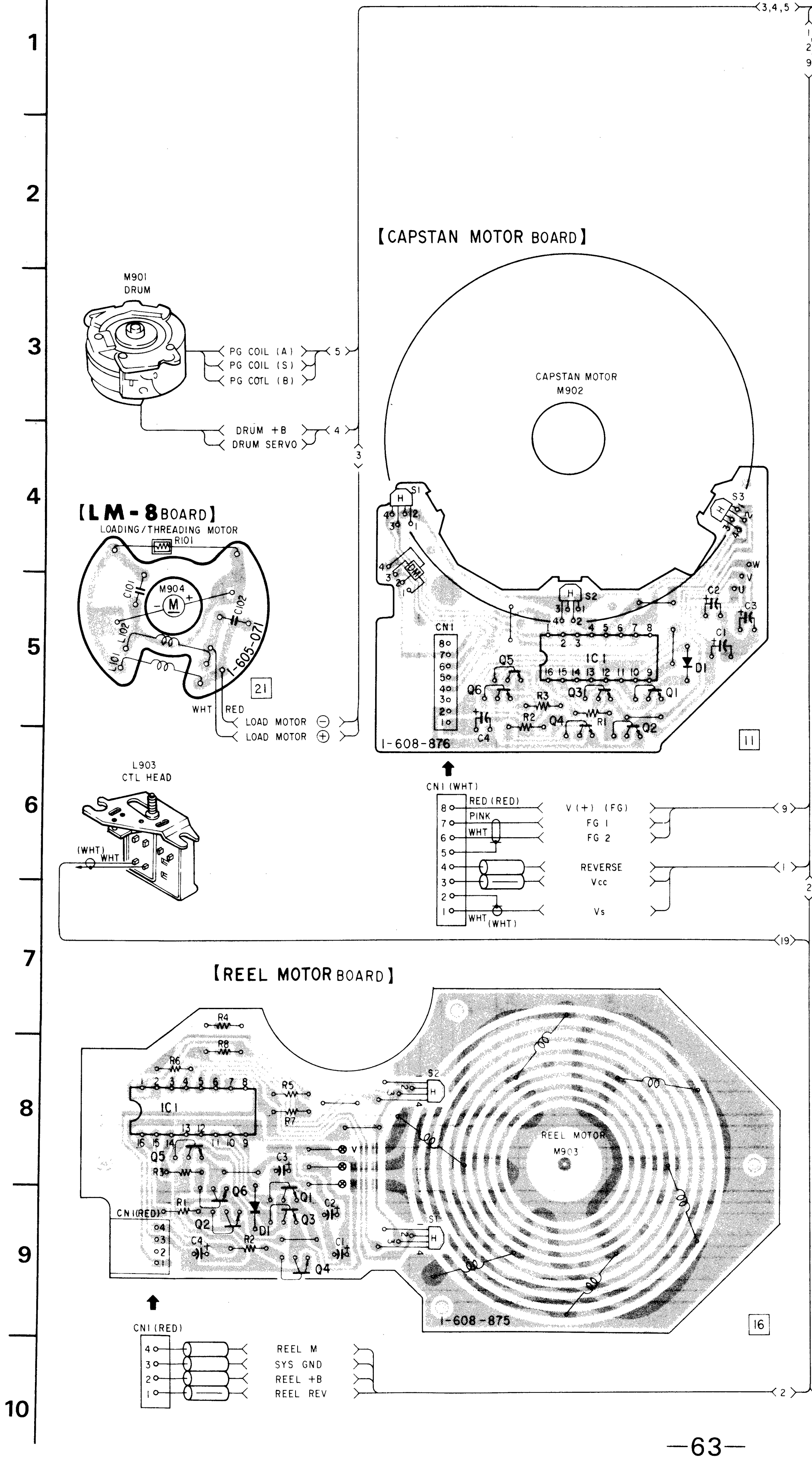
- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- ▨ Soldering side

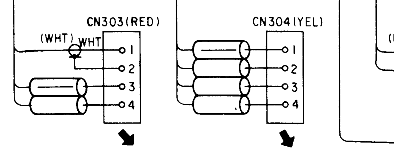
B + pattern

**SS-16** (SERVO/SYSTEM CONTROL) **FU-14** (FUNCTION SWITCH) **SW-25** (TONE INPUT SELECT SWITCH TRACKING) **RD-6** (ROTATION DETECTOR) **RD-7** (ROTATION DETECTO

| A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|

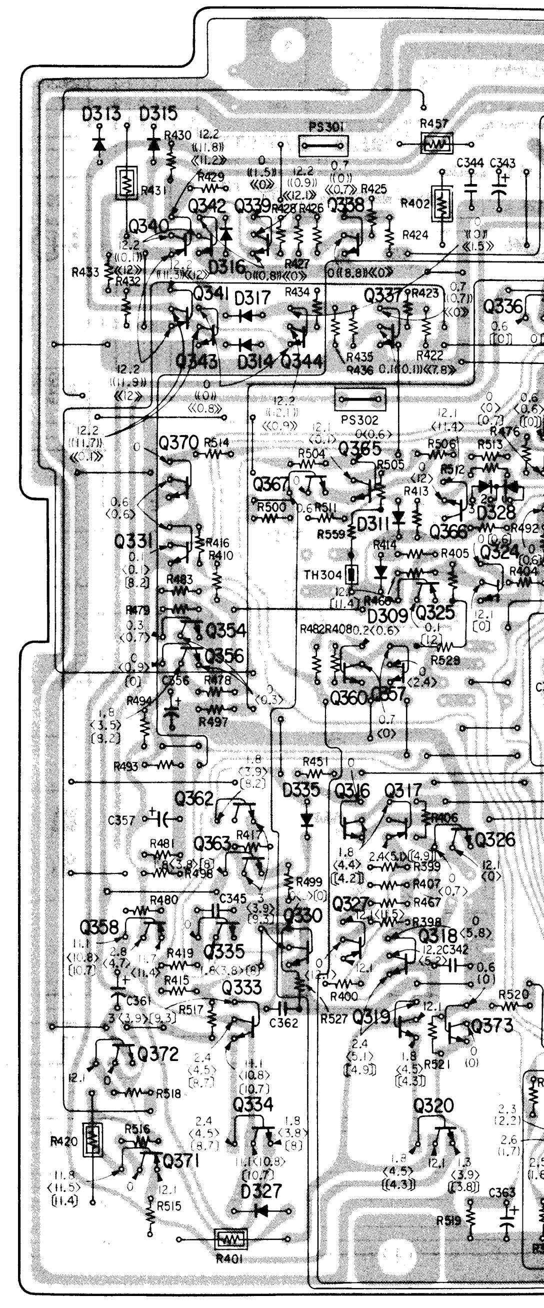
– Ref. No. SS-16 BOARD: 3000 series, FU-14 BOARD: 4700 series, SW-25 BOARD: 4600 series, RD-6, RD-7 BOARD: 9200 series, LM-8 BOARD: 9100 series, CAPSTANMOTOR BOARD: 5100 series, REE


1
2
3
4
5
6
7
8
9
10
M901 DRUM
PG COIL (A)
PG COIL (S)
PG COIL (B)
DRUM +B
DRUM SERVO
【CAPSTAN MOTOR BOARD】
CAPSTAN MOTOR M902
CN1
IC1
Q1 Q2 Q3 Q4 Q5 Q6
D1
S1 S2 S3
1-608-876
11
CN1 (WHT)
RED (RED)
PINK
WHT
V (+) (FG)
FG 1
FG 2
REVERSE
Vcc
Vs
【LM-8 BOARD】
LOADING/THREADING MOTOR
R101
M904
1-605-071
21
WHT RED
LOAD MOTOR ⊖
LOAD MOTOR ⊕
L903 CTL HEAD
(WHT) WHT
【REEL MOTOR BOARD】
IC1
Q1 Q2 Q3 Q4 Q5 Q6
REEL MOTOR M903
1-608-875
16
CN1 (RED)
REEL M
SYS GND
REEL +B
REEL REV
3,4,5
9
19
2


CN303 (RED)
(WHT) WHT
CN304 (YEL)

【SS-16 BOARD】

| Q · IC | D | TP · RV |
|---|---|---|
| | 313,315 | |
| 349,346 | | |
| 339 302,303,352 | 316 | |
| 340,342,338 347,348 | | |
| 314 | | |
| 313 | 613 | |
| 616 | 317 | |
| 341,344,337 604,614 | 301 | 406 |
| 343 336 | | RV302 |
| 321 312 | 314 302 | |
| 311,IC308 | 612,610 | |
| 345 615 | | 404 |
| 310 605,613 | | 402 |
| | | 403 |
| 355 309 332 | 326 | RV309,RV304 |
| 359 | | |
| 370,367,365 | 617 | RV301 |
| 301 | | |
| 366 IC301 620 618 | 607 | |
| 368 608 606 | 328 | |
| 607,617 | | |
| 307 609,612 | 311 616 | |
| 331 | | |
| | | 405 |
| 324 | 309 614 | RV303 |
| IC303 | | |
| 325 611 | | |
| 354 IC304 610,619 | 330 608 | 410 401 |
| 356,360,357 | 329 308 | |
| | | RV310 604 |
| | | 409 |
| 364 | 304 | |
| | | RV308,RV307 |
| IC305 636 | 335 | 603,605,602 |
| 362,316,317 | | |
| 326 | | 407,601 |
| 363 | | |
| 327 315 | | |
| IC307 IC306 IC601 | | |
| 358,335,330,318 | | |
| 322 | | |
| 627 | | |
| 333 319 373 | | |
| 372 | | |
| | 338 306 | |
| IC302 | | |
| 334,320,306,305 | | |
| 371 626 | 327 325 | |
| 624,623,631,630,629,628 | | |
| 304,622,621,625,633,634,632 | | |

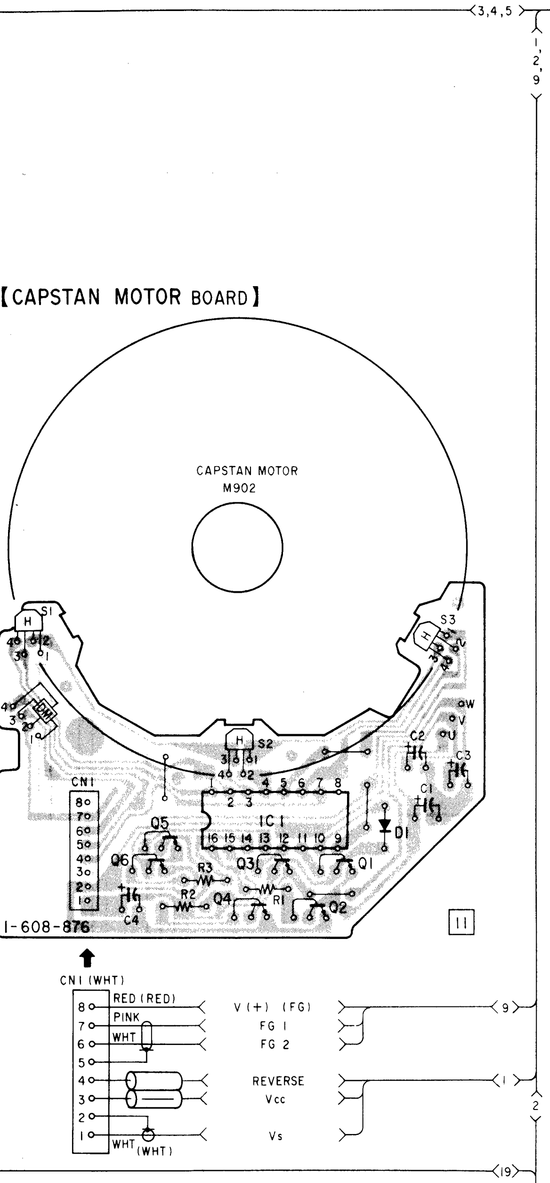

D313 D315
PS301
R457
R430
R431
Q340 Q342 Q339 Q338
R425 R402 R424
C344 C343
R433
D316 Q341 D317
R427 R434
Q337 R423 Q336
Q343 D314 Q344
R422 R436
PS302
Q370 R514
Q365 R505 R506 R513 R476
Q367 R500 R511
D311 R559 Q366 D328
R416 R410 Q331
TH304 R413 R405 Q324
R483 R460 D309 Q325
R479 Q354 Q356
R482 R408 R529
C356 R478
R494 R497 Q360 Q357
R493 R451
D335 Q316 Q317
Q362 R806
C357 Q363 R417
R481 R496
R499 R407 Q326
R480 C345 Q330
Q358 R419 Q335 R467 Q318
R415 Q333 R398 C342
R400 R529
C361 R517 C362
R527 Q319 Q373
Q372 R518
R521
Q334 Q320
R420 R516 Q371
Q327
R515 R519 C363
R401

**U-14** (FUNCTION SWITCH) **SW-25** (TONE INPUT SELECT SWITCH TRACKING) **RD-6** (ROTATION DETECTOR) **RD-7** (ROTATION DETECTOR) **LM-8** (NOISE FILTER) **CAPSTAN MOTOR** (CAPSTAN MOTOR) **REEL MOTOR** (REEL MOTOR)

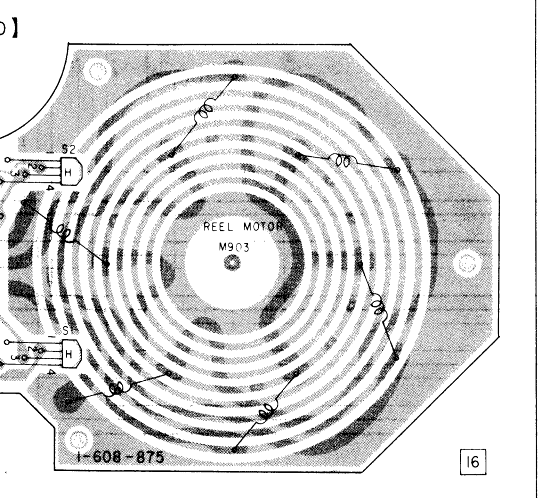
C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S

FU-14 BOARD: 4700 series, SW-25 BOARD: 4600 series, RD-6, RD-7 BOARD: 9200 series, LM-8 BOARD: 9100 series, CAPSTANMOTOR BOARD: 5100 series, REELMOTOR BOARD: 5000 series, CS-3, CS-4 BOARD: 9300 series –

【CAPSTAN MOTOR BOARD】

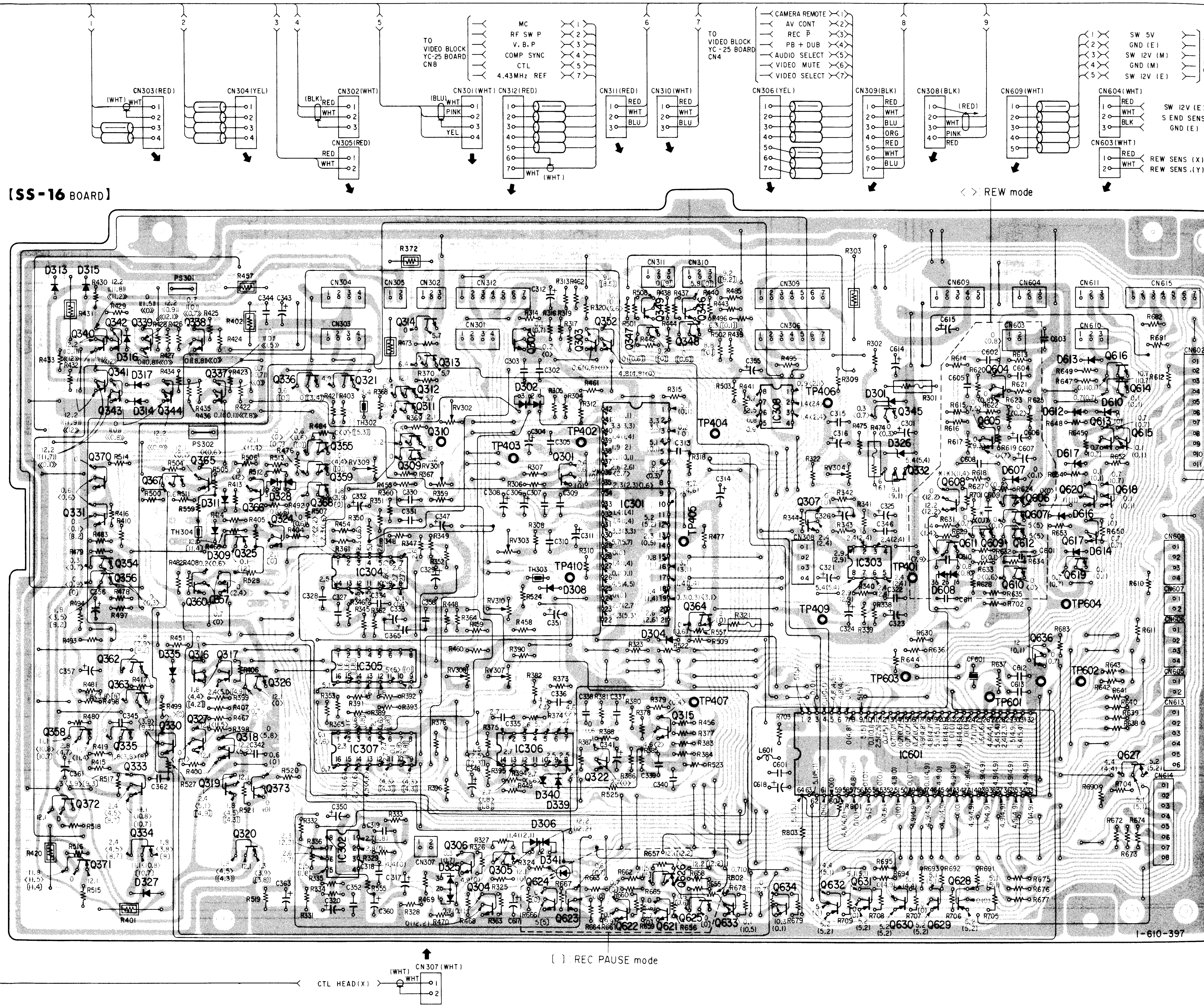

CAPSTAN MOTOR
M902
S1
S2
S3
H
CN1
IC1
Q1
Q2
Q3
Q4
Q5
Q6
R1
R2
R3
C1
C2
C3
C4
D1
1-608-876
11
CN1 (WHT)
RED (RED)
PINK
WHT
WHT (WHT)
V (+) (FG)
FG 1
FG 2
REVERSE
Vcc
Vs
9
1
2
19
3,4,5

D】


S2
H
REEL MOTOR
M903
1-608-875
16
2
19

| Q · IC | D | TP · RV |
|---|---|---|
| | 313,315 | |
| 349,346 | | |
| 339 | | |
| 340,342,338 302,303,352 347,348 | 316 | |
| 314 | | |
| 313 | 613 | |
| 341,344,337 616 | 317 | |
| 343 336 604,614 | 301 | 406 |
| 321 312 | 314 302 | RV302 |
| 311,IC308 | 612,610 | |
| 345 615 | | 404 |
| 310 605,613 | | 402 |
| | | 403 |
| 355 309 332 | 326 | RV309,RV304 |
| 359 | 617 | |
| 370,367,365 | | RV301 |
| 366 301 620 | 607 | |
| 368 IC301 618 | | |
| 608 606 | 328 | |
| 307 607,617 | | |
| 609,612 | 311 616 | |
| 331 | | |
| 324 | | 405 |
| | 309 614 | RV303 |
| 325 IC303 611 | | |
| 354 IC304 610,619 | 330 608 | 410 401 |
| 356,360,357 | 329 308 | |
| | | RV310 604 |
| | | 409 |
| 364 | 304 | |
| | | RV308,RV307 |
| IC305 636 | 335 | 603,605,602 |
| 362,316,317 | | |
| 326 | | 407,601 |
| 363 | | |
| 327 315 | | |
| IC307 IC306 IC601 | | |
| 358,335,330,318 | | |
| 322 | | |
| 627 | | |
| 333 319 373 | | |
| 372 | | |
| | 338 306 | |
| IC302 | | |
| 334,320,306,305 | | |
| 371 626 | 327 325 | |
| 624,623,631,630,629,628 | | |
| 304,622,621,625,633,634,632 | | |

【SS-16 BOARD】


TO VIDEO BLOCK YC-25 BOARD CN8
MC
RF SW P
V. B. P
COMP SYNC
CTL
4.43MHz REF
TO VIDEO BLOCK YC-25 BOARD CN4
CAMERA REMOTE
AV CONT
REC P̄
PB + DUB
AUDIO SELECT
VIDEO MUTE
VIDEO SELECT
SW 5V
GND (E)
SW 12V (M)
GND (M)
SW 12V (E)
S END SENS
REW SENS (X)
REW SENS (Y)
CN303 (RED)
CN304 (YEL)
CN302 (WHT)
CN305 (RED)
CN301 (WHT)
CN312 (RED)
CN311 (RED)
CN310 (WHT)
CN306 (YEL)
CN309 (BLK)
CN308 (BLK)
CN609 (WHT)
CN604 (WHT)
CN603 (WHT)
CN307 (WHT)
CTL HEAD (X)
RED
WHT
BLK
BLU
PINK
YEL
ORG
IC301
IC302
IC303
IC304
IC305
IC306
IC307
IC308
IC601
TP401
TP402
TP403
TP404
TP405
TP406
TP407
TP409
TP410
TP601
TP602
TP603
TP604
PS301
PS302
TH302
TH303
TH304
L601
CF601
1-610-397
1
2
3
4
5
6
7
8
9
19

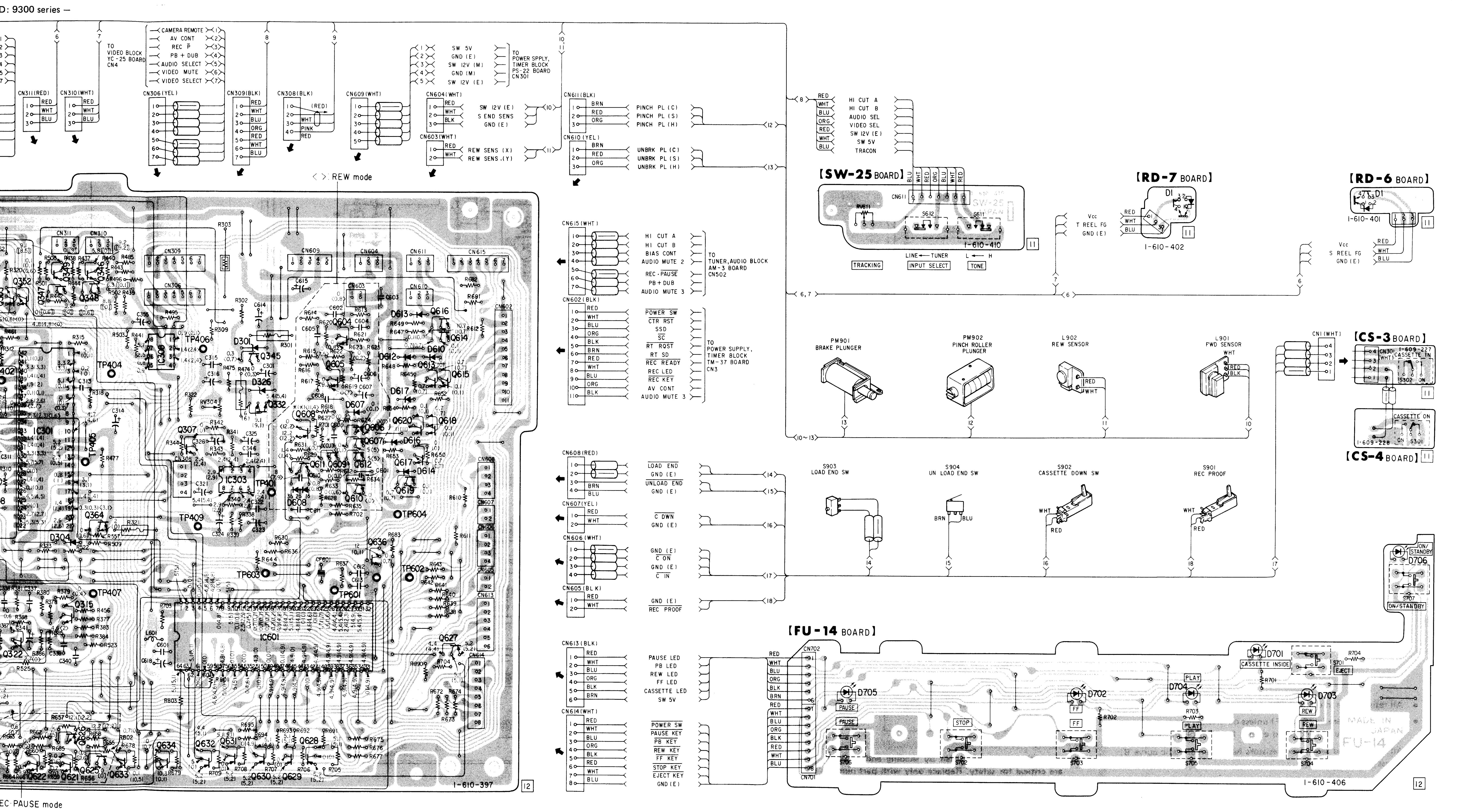
< >: REW mode

[ ] REC PAUSE mode

**PSTAN MOTOR** (CAPSTAN MOTOR) **REEL MOTOR** (REEL MOTOR) **CS-3** (CASSETTE ON SWITCH) **CS-4** (CASSETTE IN SWITCH)

N O P Q R S T U V W X Y Z A1 B1 C1 D1

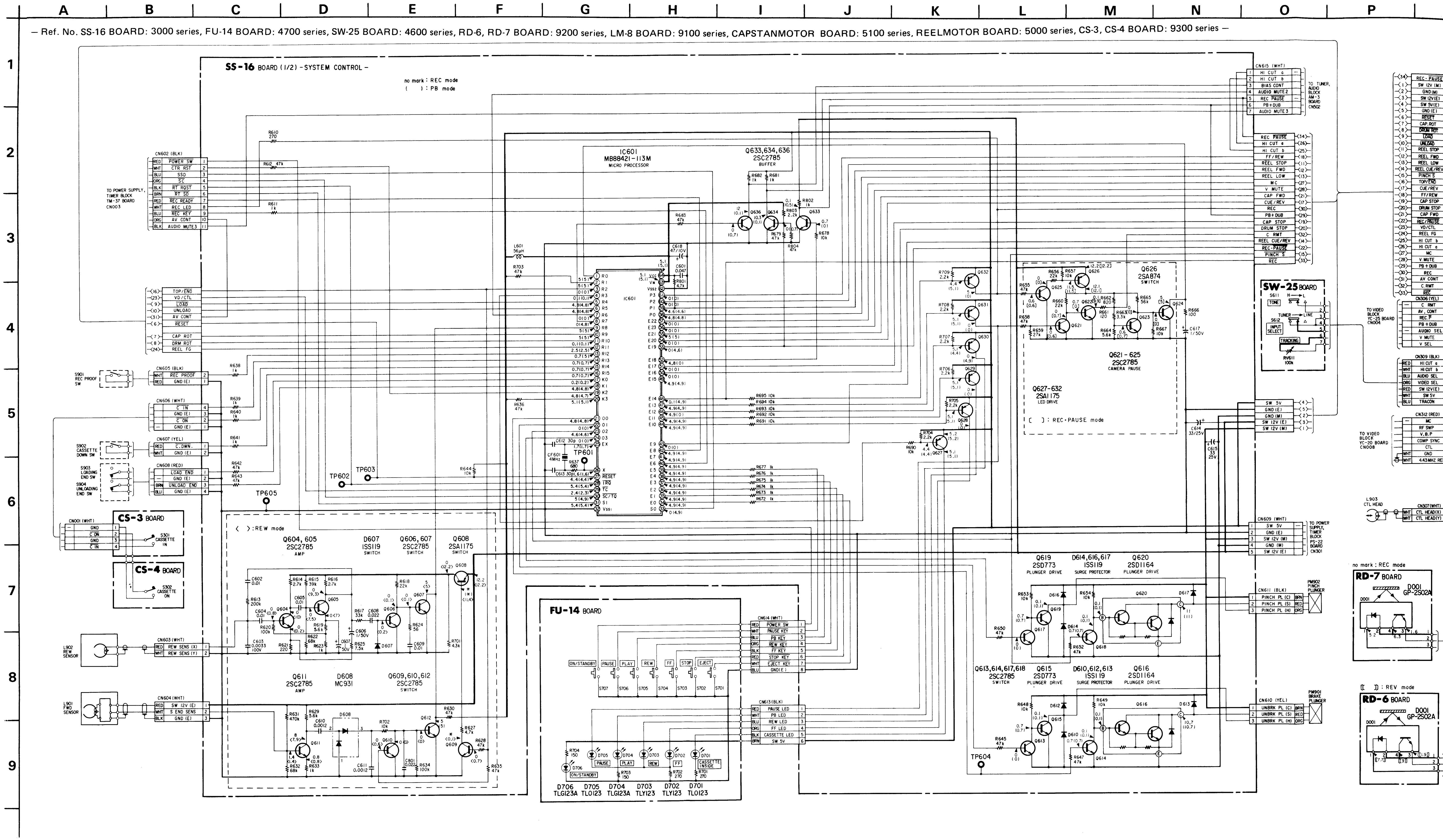
D: 9300 series –


CN311(RED)
CN310(WHT)
TO VIDEO BLOCK YC-25 BOARD CN4
CAMERA REMOTE
AV CONT
REC P
PB + DUB
AUDIO SELECT
VIDEO MUTE
VIDEO SELECT
CN306(YEL)
CN309(BLK)
CN308(BLK)
CN609(WHT)
CN604(WHT)
CN603(WHT)
SW 5V
GND (E)
SW 12V (M)
GND (M)
SW 12V (E)
TO POWER SPPLY, TIMER BLOCK PS-22 BOARD CN301
SW 12V (E)
S END SENS
GND (E)
REW SENS (X)
REW SENS (Y)
CN611(BLK)
PINCH PL (C)
PINCH PL (S)
PINCH PL (H)
CN610(YEL)
UNBRK PL (C)
UNBRK PL (S)
UNBRK PL (H)
< >: REW mode
HI CUT A
HI CUT B
AUDIO SEL
VIDEO SEL
SW 12V (E)
SW 5V
TRACON
[SW-25 BOARD]
TRACKING
LINE ← TUNER
INPUT SELECT
L ← H
TONE
1-610-410
[RD-7 BOARD]
Vcc
T REEL FG
GND (E)
1-610-402
[RD-6 BOARD]
Vcc
S REEL FG
GND (E)
1-610-401
CN615(WHT)
HI CUT A
HI CUT B
BIAS CONT
AUDIO MUTE 2
REC・PAUSE
PB + DUB
AUDIO MUTE 3
TO TUNER, AUDIO BLOCK AM-3 BOARD CN502
CN602(BLK)
POWER SW
CTR RST
SSD
SC
RT RST
RT SD
REC READY
REC LED
REC KEY
AV CONT
AUDIO MUTE 3
TO POWER SUPPLY, TIMER BLOCK TM-37 BOARD CN3
PM901 BRAKE PLUNGER
PM902 PINCH ROLLER PLUNGER
L902 REW SENSOR
L901 FWD SENSOR
CN1(WHT)
[CS-3 BOARD]
1-609-227
CASSETTE IN
S302
CASSETTE ON
S301
1-609-228
[CS-4 BOARD]
CN608(RED)
LOAD END
GND (E)
UNLOAD END
GND (E)
CN607(YEL)
C DWN
GND (E)
CN606(WHT)
GND (E)
C ON
GND (E)
C IN
CN605(BLK)
GND (E)
REC PROOF
S903 LOAD END SW
S904 UN LOAD END SW
S902 CASSETTE DOWN SW
S901 REC PROOF
CN613(BLK)
PAUSE LED
PB LED
REW LED
FF LED
CASSETTE LED
SW 5V
CN614(WHT)
POWER SW
PAUSE KEY
PB KEY
REW KEY
FF KEY
STOP KEY
EJECT KEY
GND (E)
[FU-14 BOARD]
CN702
CN701
D705 PAUSE
D702 FF
D704 PLAY
D703 REW
D701 CASSETTE INSIDE
S701 EJECT
D706 ON/STANDBY
S707 ON/STANDBY
S706 S702 S703 S705 S704
STOP
1-610-406
IC301
IC303
IC601
TP401 TP404 TP405 TP406 TP407 TP409
TP601 TP602 TP603 TP604
1-610-397
REC・PAUSE mode

# SERVO, SYSTEM CONTROL SERVO, SYSTEM CONTROL

**SS-16** (SERVO/SYSTEM CONTROL) **FU-14** (FUNCTION SWITCH) **SW-25** (TONE INPUT SELECT SWITCH TRACKING) **RD-6** (ROTATION DETECTOR) **RD-7** (ROTATION DETECTOR) **LM-8** (NOISE FILTER) **CAPSTAN MOTOR** (CAPSTAN MOTOR)

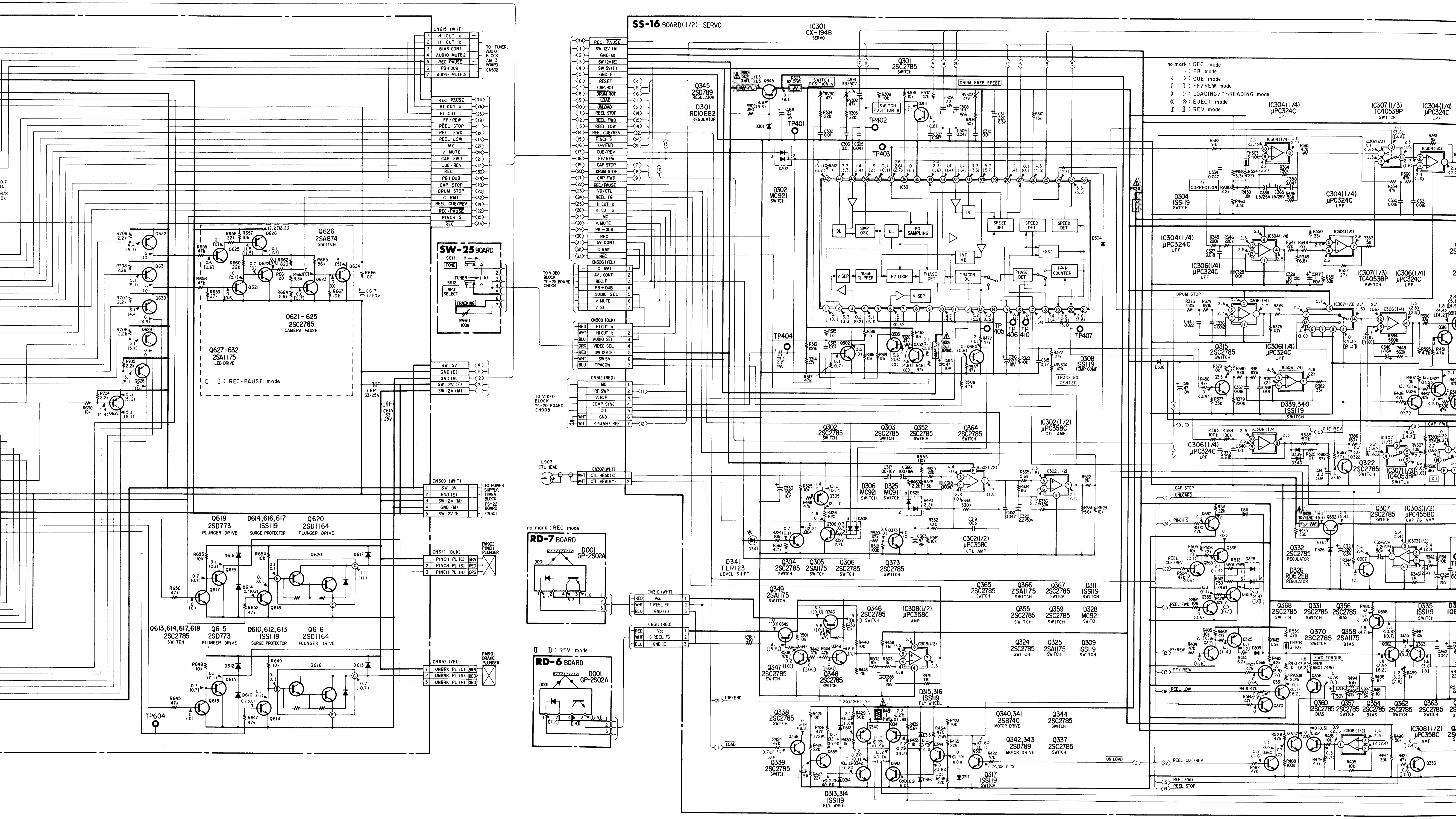
– Ref. No. SS-16 BOARD: 3000 series, FU-14 BOARD: 4700 series, SW-25 BOARD: 4600 series, RD-6, RD-7 BOARD: 9200 series, LM-8 BOARD: 9100 series, CAPSTANMOTOR BOARD: 5100 series, REELMOTOR BOARD: 5000 series, CS-3, CS-4 BOARD: 9300 series –


A B C D E F G H I J K L M N O P
1 2 3 4 5 6 7 8 9
SS-16 BOARD (1/2) -SYSTEM CONTROL-
no mark : REC mode
( ) : PB mode
IC601
MB88421-113M
MICRO PROCESSOR
Q633,634,636
2SC2785
BUFFER
CN602 (BLK)
POWER SW
CTR RST
SSD
SC
RT RQST
RT SD
REC READY
REC LED
REC KEY
AV CONT
AUDIO MUTE3
TO POWER SUPPLY, TIMER BLOCK TM-37 BOARD CN003
CN605 (BLK)
REC PROOF
S901 REC PROOF SW
CN606 (WHT)
C IN
C ON
CN607 (YEL)
C.DWN.
S902 CASSETTE DOWN SW
CN608 (RED)
LOAD END
UNLOAD END
S903 LOADING END SW
S904 UNLOADING END SW
TP601
TP602
TP603
TP604
TP605
CF601 4MHz
CS-3 BOARD
S301 CASSETTE IN
CS-4 BOARD
S302 CASSETTE ON
CN001 (WHT)
< > : REW mode
Q604, 605 2SC2785 AMP
D607 1SS119 SWITCH
Q606, 607 2SC2785 SWITCH
Q608 2SA1175 SWITCH
Q611 2SC2785 AMP
D608 MC931
Q609,610,612 2SC2785 SWITCH
CN603 (WHT)
REW SENS (X)
REW SENS (Y)
L902 REW SENSOR
CN604 (WHT)
SW 12V (E)
S END SENS
L901 FWD SENSOR
FU-14 BOARD
ON/STANDBY
PAUSE
PLAY
REW
FF
STOP
EJECT
S707 S706 S705 S704 S703 S702 S701
CN614 (WHT)
POWER SW
PAUSE KEY
PB KEY
REW KEY
FF KEY
STOP KEY
EJECT KEY
CN613 (BLK)
PAUSE LED
PB LED
REW LED
FF LED
CASSETTE LED
SW 5V
CASSETTE INSIDE
D706 TLG123A
D705 TLO123
D704 TLG123A
D703 TLY123
D702 TLY123
D701 TLO123
Q627-632 2SA1175 LED DRIVE
[ ] : REC•PAUSE mode
Q621 - 625 2SC2785 CAMERA PAUSE
Q626 2SA874 SWITCH
CN615 (WHT)
HI CUT a
HI CUT b
BIAS CONT
AUDIO MUTE2
REC PAUSE
PB+DUB
AUDIO MUTE 3
TO TUNER, AUDIO BLOCK AM-3 BOARD CN502
SW-25 BOARD
S611 TONE
TUNER LINE
S612 INPUT SELECT
TRACKING
RV611 100k
TO VIDEO BLOCK YC-25 BOARD CN004
TO VIDEO BLOCK YC-20 BOARD CN008
CN609 (WHT)
SW 5V
GND (E)
GND (M)
SW 12V (M)
SW 12V (E)
TO POWER SUPPLY, TIMER BLOCK PS-22 BOARD CN301
Q619 2SD773 PLUNGER DRIVE
D614,616,617 1SS119 SURGE PROTECTOR
Q620 2SD1164 PLUNGER DRIVE
Q613,614,617,618 2SC2785 SWITCH
Q615 2SD773 PLUNGER DRIVE
D610,612,613 1SS119 SURGE PROTECTOR
Q616 2SD1164 PLUNGER DRIVE
CN611 (BLK)
PINCH PL (C)
PINCH PL (S)
PINCH PL (H)
PM902 PINCH PLUNGER
CN610 (YEL)
UNBRK PL (C)
UNBRK PL (S)
UNBRK PL (H)
PM901 BRAKE PLUNGER
L903 CTL HEAD
CN307 (WHT)
CTL HEAD(X)
CTL HEAD(Y)
no mark : REC mode
RD-7 BOARD
D001 GP-2S02A
[ ] : REV mode
RD-6 BOARD
D001 GP-2S02A

**7** (ROTATION DETECTOR) **LM-8** (NOISE FILTER) **CAPSTAN MOTOR** (CAPSTAN MOTOR) **REEL MOTOR** (REEL MOTOR) **CS-3** (CASSETTE ON SWITCH) **CS-4** (CASSETTE IN SWITCH)

J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

BOARD: 5100 series, REELMOTOR BOARD: 5000 series, CS-3, CS-4 BOARD: 9300 series –


SS-16 BOARD (1/2) -SERVO-
IC301 CX-194B SERVO
Q301 2SC2785 SWITCH
Q345 2SD789 REGULATOR
D301 RD10EB2 REGULATOR
D302 MC921 SWITCH
TP401
TP402
TP403
TP404
TP405
TP406
TP407
TP410
DRUM FREE SPEED
SWITCH POSITION A
SWITCH POSITION B
DL
SWP OSC
PG SAMPLING
SPEED DET
FGx4
INT VD
V SEP
NOISE CLIPPER
P2 LOOP
PHASE DET
TRACON DL
1/4 N COUNTER
TRACKING CENTER
D308 1SS119 TEMP COMP
Q302 2SC2785 SWITCH
Q303 2SC2785 SWITCH
Q352 2SC2785 SWITCH
Q364 2SC2785 SWITCH
IC302 (1/2) μPC358C CTL AMP
D306 MC921 SWITCH
D325 MC911 SWITCH
D341 TLR123 LEVEL SHIFT
Q304 2SC2785 SWITCH
Q305 2SA1175 SWITCH
Q306 2SC2785 SWITCH
Q373 2SC2785 SWITCH
Q349 2SA1175 SWITCH
Q346 2SC2785 SWITCH
IC308 (1/2) μPC358C AMP
Q347 2SC2785 SWITCH
Q348 2SC2785 SWITCH
D315, 316 1SS119 FLY WHEEL
Q338 2SC2785 SWITCH
Q339 2SC2785 SWITCH
D313, 314 1SS119 FLY WHEEL
Q340, 341 2SB740 MOTOR DRIVE
Q342, 343 2SD789 MOTOR DRIVE
Q344 2SC2785 SWITCH
Q337 2SC2785 SWITCH
D317 1SS119 SWITCH
Q365 2SC2785 SWITCH
Q366 2SA1175 SWITCH
Q367 2SC2785 SWITCH
D311 1SS119 SWITCH
Q355 2SC2785 SWITCH
Q359 2SC2785 SWITCH
D328 MC921 SWITCH
Q324 2SC2785 SWITCH
Q325 2SA1175 SWITCH
D309 1SS119 SWITCH
no mark : REC mode
( ) : PB mode
< > : CUE mode
[ ] : FF/REW mode
(( )) : LOADING/THREADING mode
« » : EJECT mode
[[ ]] : REV mode
IC304 (1/4) μPC324C LPF
IC307 (1/3) TC4053BP SWITCH
IC306 (1/4) μPC324C LPF
D304 1SS119 SWITCH
TH CORRECTION
Q315 2SC2785 SWITCH
D339, 340 1SS119 SWITCH
Q322 2SC2785 SWITCH
Q307 2SC2785 SWITCH
IC303 (1/2) CAP FG AMP
Q332 2SC2785 REGULATOR
D326 RD6.2EB REGULATOR
Q368 2SC2785 SWITCH
Q331 2SC2785 SWITCH
Q356 2SC2785 BIAS
D335 1SS119 SWITCH
Q370 2SC2785 SWITCH
Q358 2SA1175 BIAS
Q360 2SC2785 BIAS
Q357 2SC2785 SWITCH
Q354 2SC2785 BIAS
Q362 2SC2785 SWITCH
Q363 2SC2785 SWITCH
IC308 (1/2) μPC358C AMP
FWD TORQUE
DRUM STOP
CUE REV
CAP STOP
UNLOAD
PINCH S
REEL CUE/REV
REEL FWD
FF/REW
REEL LOW
TOP/END
LOAD
REEL STOP
CN615 (WHT)
TO TUNER, AUDIO BLOCK AM-3 BOARD CN502
HI CUT a
HI CUT b
BIAS CONT
AUDIO MUTE 2
REC PAUSE
PB+DUB
AUDIO MUTE 3
REC PAUSE
REEL STOP
REEL FWD
REEL LOW
MC
V MUTE
CAP FWD
CUE/REV
REC
PB+DUB
CAP STOP
DRUM STOP
C RMT
REEL CUE/REV
REC PAUSE
PINCH S
SW 12V (M)
GND (M)
SW 12V (E)
SW 5V (E)
GND (E)
RESET
CAP. ROT
DRUM ROT
UNLOAD
TOP/END
FF/REW
VD/CTL
REEL FG
AV CONT
SW-25 BOARD
S611 TONE
S612 INPUT SELECT
TUNER LINE
TRACKING
RV611 100k
CN306 (YEL)
TO VIDEO BLOCK YC-25 BOARD CN004
C RMT
AV. CONT
REC P
PB+DUB
AUDIO SEL
V MUTE
V SEL
CN309 (BLK)
HI CUT a
HI CUT b
AUDIO SEL
VIDEO SEL
SW 12V (E)
SW 5V
TRACON
CN312 (RED)
TO VIDEO BLOCK YC-20 BOARD CN008
RF SWP
V.B.P
COMP SYNC
CTL
GND
4.43MHz REF
L903 CTL HEAD
CN307 (WHT)
CTL HEAD (X)
CTL HEAD (Y)
SW 5V
GND (E)
GND (M)
SW 12V (M)
SW 12V (E)
CN609 (WHT)
TO POWER SUPPLY, TIMER BLOCK PS-22 BOARD CN301
Q632
Q631
Q630
Q629
Q628
Q627
Q626 2SA874 SWITCH
Q621-625 2SC2785 CAMERA PAUSE
Q627-632 2SA1175 LED DRIVE
[ ] : REC-PAUSE mode
Q619 2SD773 PLUNGER DRIVE
D614, 616, 617 1SS119 SURGE PROTECTOR
Q620 2SD1164 PLUNGER DRIVE
Q613, 614, 617, 618 2SC2785 SWITCH
Q615 2SD773 PLUNGER DRIVE
D610, 612, 613 1SS119 SURGE PROTECTOR
Q616 2SD1164 PLUNGER DRIVE
TP604
CN611 (BLK)
PINCH PL (C)
PINCH PL (S)
PINCH PL (H)
PM902 PINCH PLUNGER
CN610 (YEL)
UNBRK PL (C)
UNBRK PL (S)
UNBRK PL (H)
PM901 BRAKE PLUNGER
no mark : REC mode
RD-7 BOARD
D001 GP-2S02A
[[ ]] : REV mode
RD-6 BOARD
D001 GP-2S02A
CN310 (WHT)
Vcc
T REEL FG
GND (E)
CN311 (RED)
Vcc
S REEL FG
GND (E)

**CS-3** (CASSETTE ON SWITCH) **CS-4** (CASSETTE IN SWITCH)

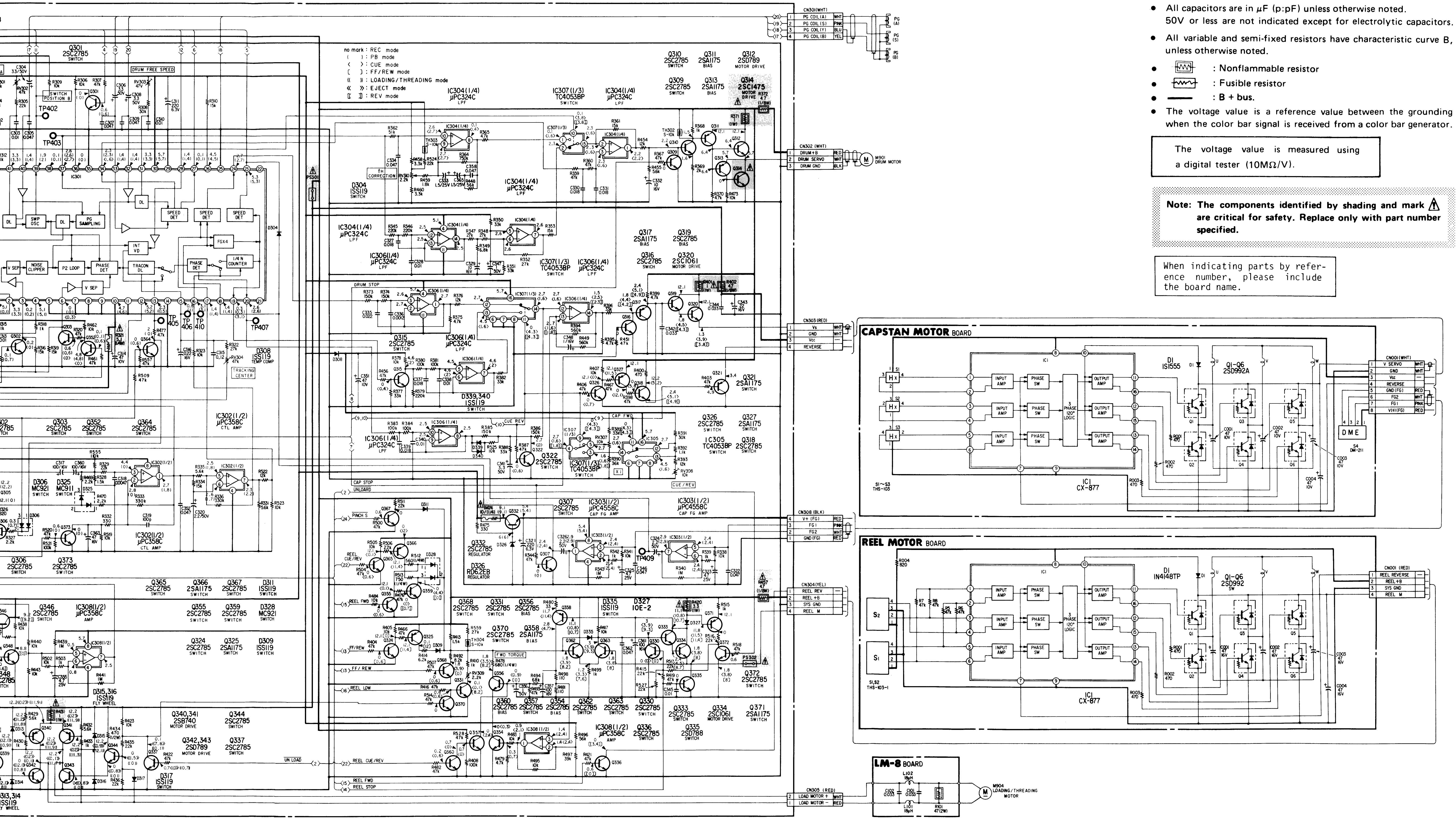
T U V W X Y Z A1 B1 C1 D1 E1 F1 G1 H1 I1

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : Nonflammable resistor
- ▭ : Fusible resistor
- —— : B + bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

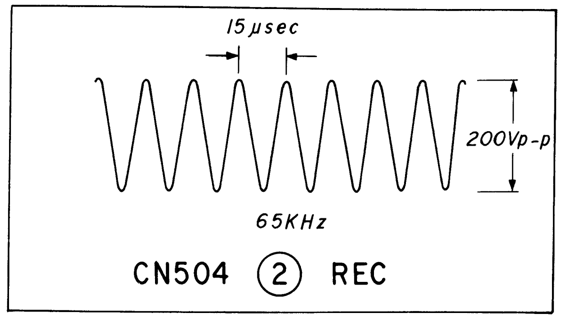
The voltage value is measured using a digital tester (10MΩ/V).

**Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

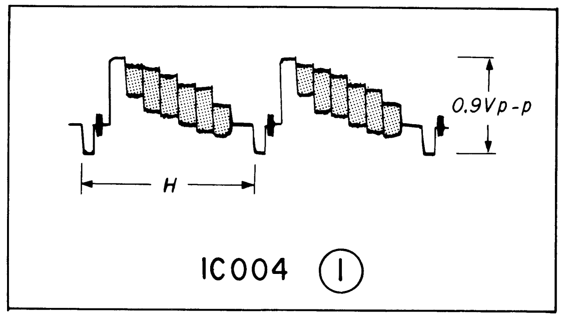
When indicating parts by reference number, please include the board name.


no mark : REC mode
( ) : PB mode
< > : CUE mode
[ ] : FF/REW mode
(( )) : LOADING/THREADING mode
« » : EJECT mode
[[ ]] : REV mode
IC301
IC302(1/2) µPC358C CTL AMP
IC303(1/2) µPC4558C CAP FG AMP
IC304(1/4) µPC324C LPF
IC306(1/4) µPC324C LPF
IC307(1/3) TC4053BP SWITCH
IC308(1/2) µPC358C AMP
IC305 TC4053BP SWITCH
Q312 2SD789 MOTOR DRIVE
Q314 2SC1475 MOTOR DRIVE
Q320 2SC1061 MOTOR DRIVE
Q334 2SC1061 MOTOR DRIVE
Q335 2SD788 SWITCH
Q340,341 2SB740 MOTOR DRIVE
Q342,343 2SD789 MOTOR DRIVE
D326 RD6.2EB REGULATOR
DRUM FREE SPEED
DRUM STOP
CAP STOP
UNLOAD
PINCH S
REEL CUE/REV
REEL FWD
FF/REW
REEL LOW
FWD TORQUE
UN LOAD
REEL STOP
TRACKING CENTER
CN301(WHT) PG COIL(A) PG COIL(S) PG COIL(Y) PG COIL(B)
CN302(WHT) DRUM+B DRUM SERVO DRUM GND
M901 DRUM MOTOR
CN303(RED) Vs GND Vcc REVERSE
CN308(BLK) V+(FG) FG1 FG2 GND(FG)
CN304(YEL) REEL REV REEL +B SYS GND REEL M
CN305(RED) LOAD MOTOR + LOAD MOTOR -
CAPSTAN MOTOR BOARD
IC1 CX-877
D1 1S1555
Q1-Q6 2SD992A
CN001(WHT) V SERVO GND Vcc REVERSE GND(FG) FG2 FG1 V(H)(FG)
DME
S4 DM-211
S1~S3 THS-103
REEL MOTOR BOARD
D1 1N4148TP
Q1-Q6 2SD992
CN001(RED) REEL REVERSE REEL+B SYS GND REEL M
S1,S2 THS-103-1
LM-8 BOARD
M904 LOADING/THREADING MOTOR
INPUT AMP
PHASE SW
3 PHASE 120° LOGIC
OUTPUT AMP

## AM-3 BOARD



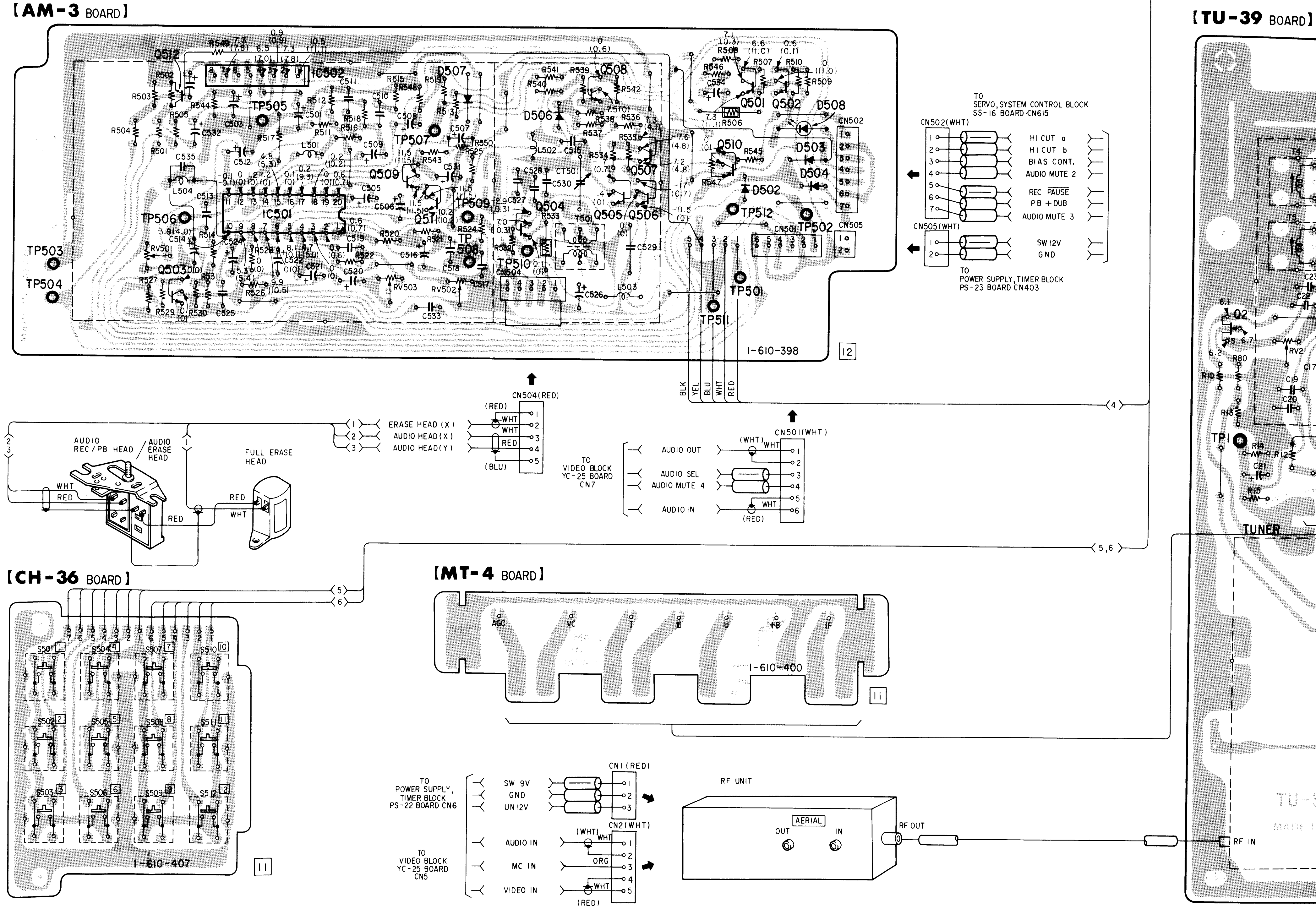
## TU-39 BOARD



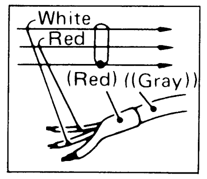
**TU-39** (VIF, SIF, AFC, CHANNEL PRESET) **AM-3** (AUDIO RECORD/ PLAY BACK PROCESS) **CH-36** (CHANNEL SWITCH) **MT-4** (INTERMEDIATION)

– Ref. No. TU-39 BOARD: 4000 series, AM-3 BOARD: 5500 series, CH-36 BOARD: 8500 series –

| | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|
| IC<br>Q | | 503 | IC502<br>IC501 | 509<br>511 | 504 | 508<br>507<br>505, 506 | 501 502<br>510 | |
| D | | | | | 507<br>506 | | 501<br>502 | 503<br>504 |
| TP<br>RV | 503<br>504 | RV501<br>506 | 505 | 507<br>RV503<br>RV502 508 | 509<br>510<br>CT1 | | 512<br>501<br>511<br>502 | |

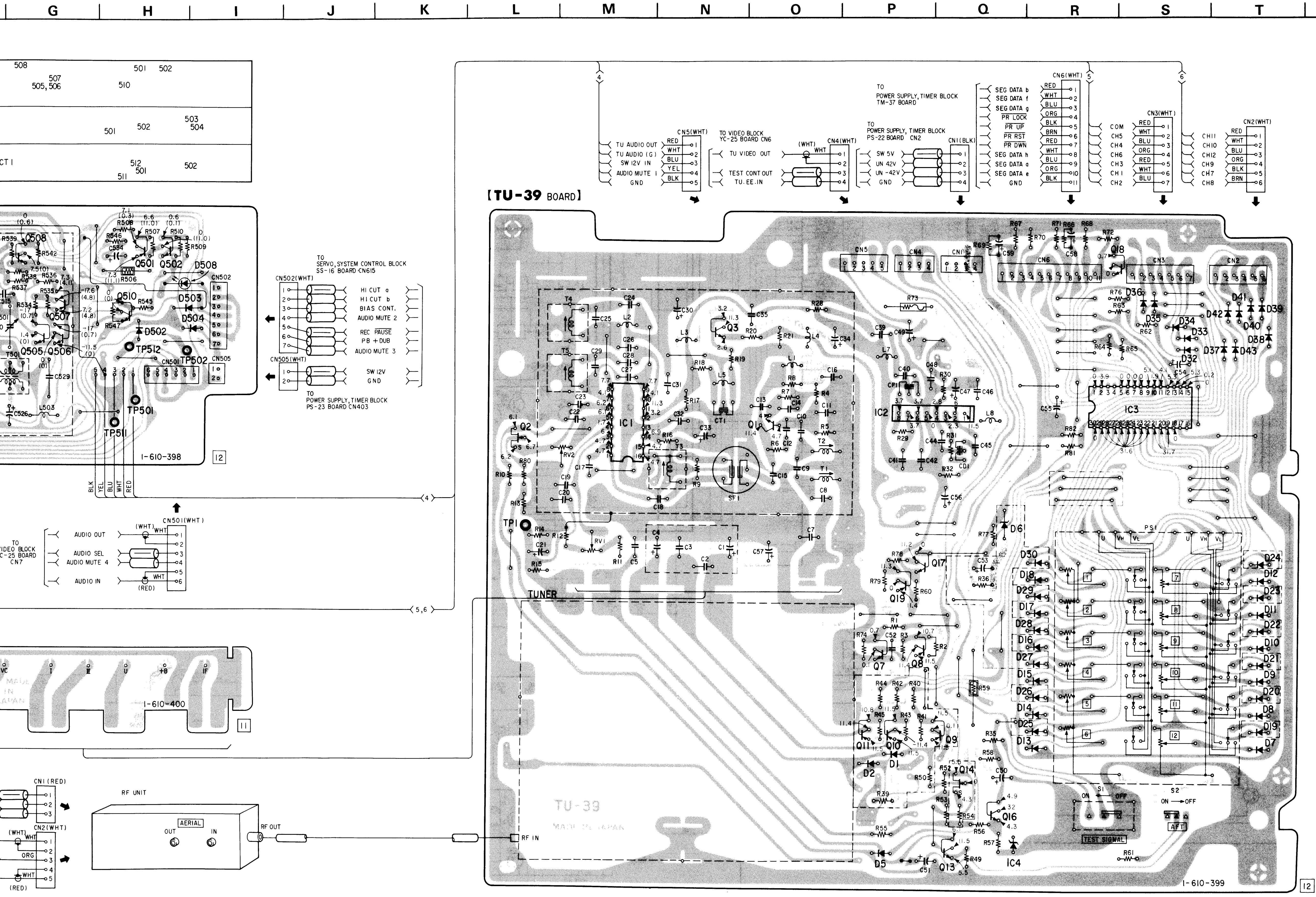

A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
7
8
9
[AM-3 BOARD]
[TU-39 BOARD]
[CH-36 BOARD]
[MT-4 BOARD]
IC502
IC501
Q512
Q503
Q509
Q511
Q508
Q501
Q502
Q510
Q507
Q504
Q505
Q506
D506
D507
D508
D503
D504
D502
TP503
TP504
TP505
TP506
TP507
TP508
TP509
TP510
TP511
TP512
TP501
TP502
RV501
RV502
RV503
CT501
CN502
CN501
CN505
CN504
1-610-398
12
TO SERVO, SYSTEM CONTROL BLOCK SS-16 BOARD CN615
CN502(WHT)
HI CUT a
HI CUT b
BIAS CONT.
AUDIO MUTE 2
REC PAUSE
PB +DUB
AUDIO MUTE 3
CN505(WHT)
SW 12V
GND
TO POWER SUPPLY, TIMER BLOCK PS-23 BOARD CN403
BLK
YEL
BLU
WHT
RED
CN504(RED)
ERASE HEAD (X)
AUDIO HEAD (X)
AUDIO HEAD (Y)
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
TO VIDEO BLOCK YC-25 BOARD CN7
AUDIO OUT
AUDIO SEL
AUDIO MUTE 4
AUDIO IN
CN501(WHT)
S501
S502
S503
S504
S505
S506
S507
S508
S509
S510
S511
S512
1-610-407
11
AGC
VC
I
II
U
+B
IF
1-610-400
11
TO POWER SUPPLY, TIMER BLOCK PS-22 BOARD CN6
SW 9V
GND
UN 12V
CN1(RED)
TO VIDEO BLOCK YC-25 BOARD CN5
AUDIO IN
MC IN
VIDEO IN
CN2(WHT)
ORG
RF UNIT
AERIAL
OUT
IN
RF OUT
RF IN
TUNER
Q2
TP1
RV2
4
5,6
5
6

- Color code of sleeving over the end of the jacket.


White
Red
(Red) ((Gray))

- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- ▨ Soldering side
- ▨ B + pattern

WITCH) **MT-4** (INTERMEDIATION)

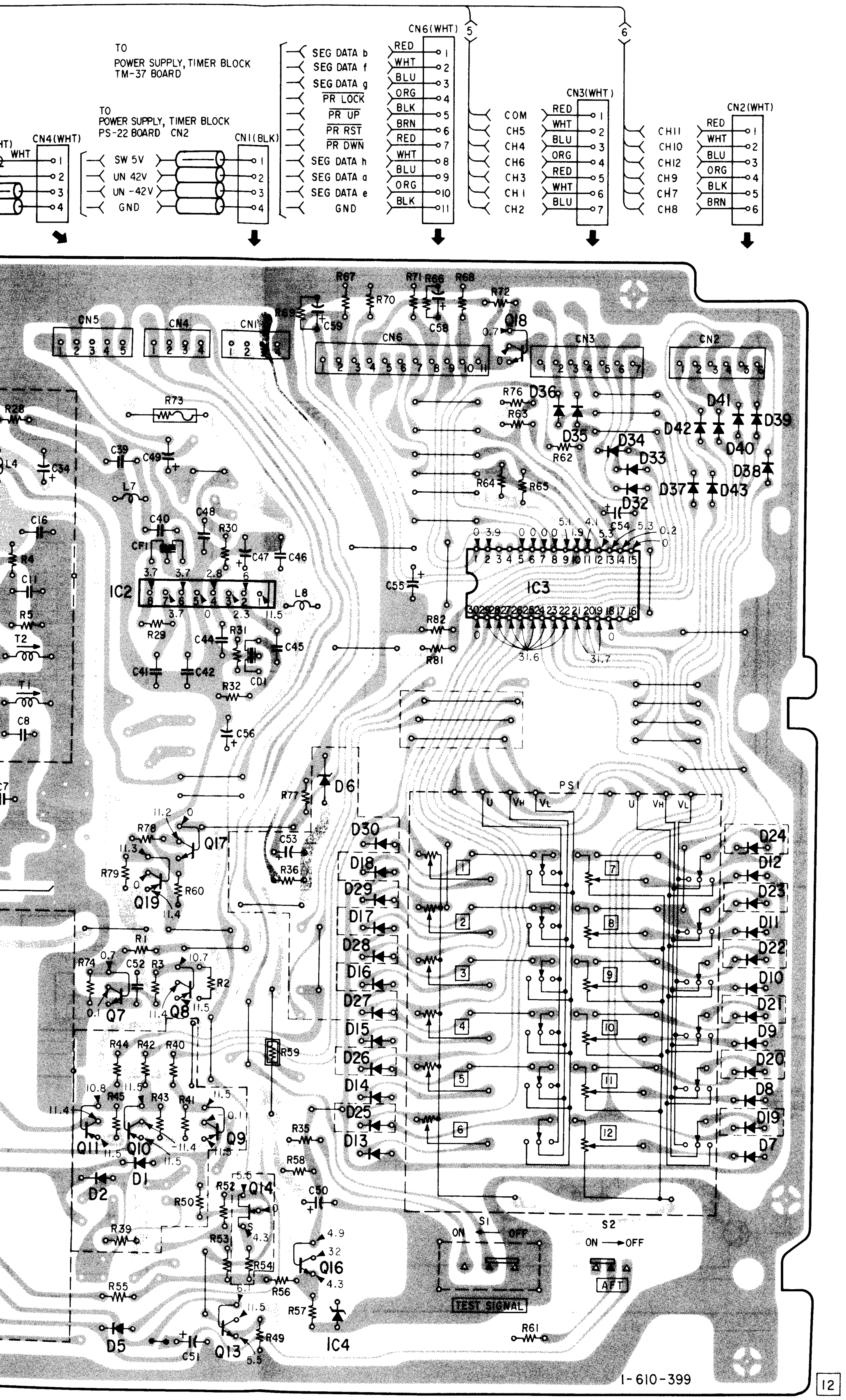

G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
【TU-39 BOARD】
TO SERVO, SYSTEM CONTROL BLOCK SS-16 BOARD CN615
CN502(WHT)
HI CUT a
HI CUT b
BIAS CONT.
AUDIO MUTE 2
REC PAUSE
PB +DUB
AUDIO MUTE 3
CN505(WHT)
SW 12V
GND
TO POWER SUPPLY, TIMER BLOCK PS-23 BOARD CN403
CN501(WHT)
TO VIDEO BLOCK YC-25 BOARD CN7
AUDIO OUT
AUDIO SEL
AUDIO MUTE 4
AUDIO IN
1-610-398
1-610-400
CN5(WHT)
TU AUDIO OUT
TU AUDIO (G)
SW 12V IN
AUDIO MUTE 1
GND
TO VIDEO BLOCK YC-25 BOARD CN6
CN4(WHT)
TU VIDEO OUT
TEST CONT OUT
TU.EE.IN
TO POWER SUPPLY, TIMER BLOCK TM-37 BOARD
TO POWER SUPPLY, TIMER BLOCK PS-22 BOARD CN2
CN11(BLK)
SW 5V
UN 42V
UN -42V
GND
CN6(WHT)
SEG DATA b
SEG DATA f
SEG DATA g
PR LOCK
PR UP
PR RST
PR DWN
SEG DATA h
SEG DATA a
SEG DATA e
CN3(WHT)
COM
CH5
CH4
CH6
CH3
CH1
CH2
CN2(WHT)
CH11
CH10
CH12
CH9
CH7
CH8
CN1(RED)
CN2(WHT)
RF UNIT
AERIAL
OUT
IN
RF OUT
RF IN
TUNER
TU-39 MADE IN JAPAN
IC1
IC2
IC3
IC4
TEST SIGNAL
AFT
1-610-399

| IC·Q | D | TP·RV |
|---|---|---|
| 18 | | |
| 3 | 36,35 42,41 40,39 34 33 32 37 43 38 | |
| 1 2 IC1 IC2 IC3 | | |
| | | RV2 |
| | 6 | 1 RV1 |
| 17 | 30 24 | |
| 19 | 18 12 | |
| | 29 23 | |
| | 17 11 | |
| | 28 22 | |
| 7,8 | 16 10 | |
| | 27 21 | |
| | 15 9 | |
| | 26 20 | |
| | 14 8 | |
| 11,10,9 | 25 19 | |
| | 10,13 7 | |
| | 1 2 | |
| 14 | | |
| 16 | | |
| 13 IC4 | 5 | |

[12]

⬚ AEP/E MODEL ONLY

| P | Q | R | S | T | U | V | W | X | Y | Z | A1 | B1 | C1 | D1 | E1 |


TO
POWER SUPPLY, TIMER BLOCK
TM-37 BOARD
TO
POWER SUPPLY, TIMER BLOCK
PS-22 BOARD CN2
CN4(WHT)
CN1(BLK)
SW 5V
UN 42V
UN -42V
GND
CN6(WHT)
SEG DATA b
SEG DATA f
SEG DATA g
PR LOCK
PR UP
PR RST
PR DWN
SEG DATA h
SEG DATA a
SEG DATA e
GND
RED
WHT
BLU
ORG
BLK
BRN
CN3(WHT)
COM
CH5
CH4
CH6
CH3
CH1
CH2
CN2(WHT)
CH11
CH10
CH12
CH9
CH7
CH8
CN5
CN4
CN1
CN6
CN3
CN2
IC2
IC3
IC4
PS1
S1
ON
OFF
S2
ON → OFF
AFT
TEST SIGNAL
Q7
Q8
Q9
Q10
Q11
Q13
Q14
Q16
Q17
Q18
Q19
1-610-399
12

AEP/E MODEL ONLY

| IC·Q | D | TP·RV |
|---|---|---|
| 18 | | |
| 3 | 36,35<br>42,41 40,39<br>34<br>33<br>32 37 43 38 | |
| 1 IC3<br>IC2<br>2 IC1 | | |
| | | RV2 |
| | 6 | 1 RV1 |
| 17 | 30 24 | |
| 19 | 18 12 | |
| | 29 23 | |
| | 17 11 | |
| | 28 22 | |
| 7,8 | 16 10 | |
| | 27 21 | |
| | 15 9 | |
| | 26 20 | |
| | 14 8 | |
| 11,10,9 | 25 19 | |
| | 10,13 7<br>1<br>2 | |
| 14 | | |
| 16 | | |
| 13 IC4 | 5 | |

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in $\mu$F (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▨ : Nonflammable resistor
- ⏛ : Fusible resistor
- —— : B + bus.
- - - - : B − bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

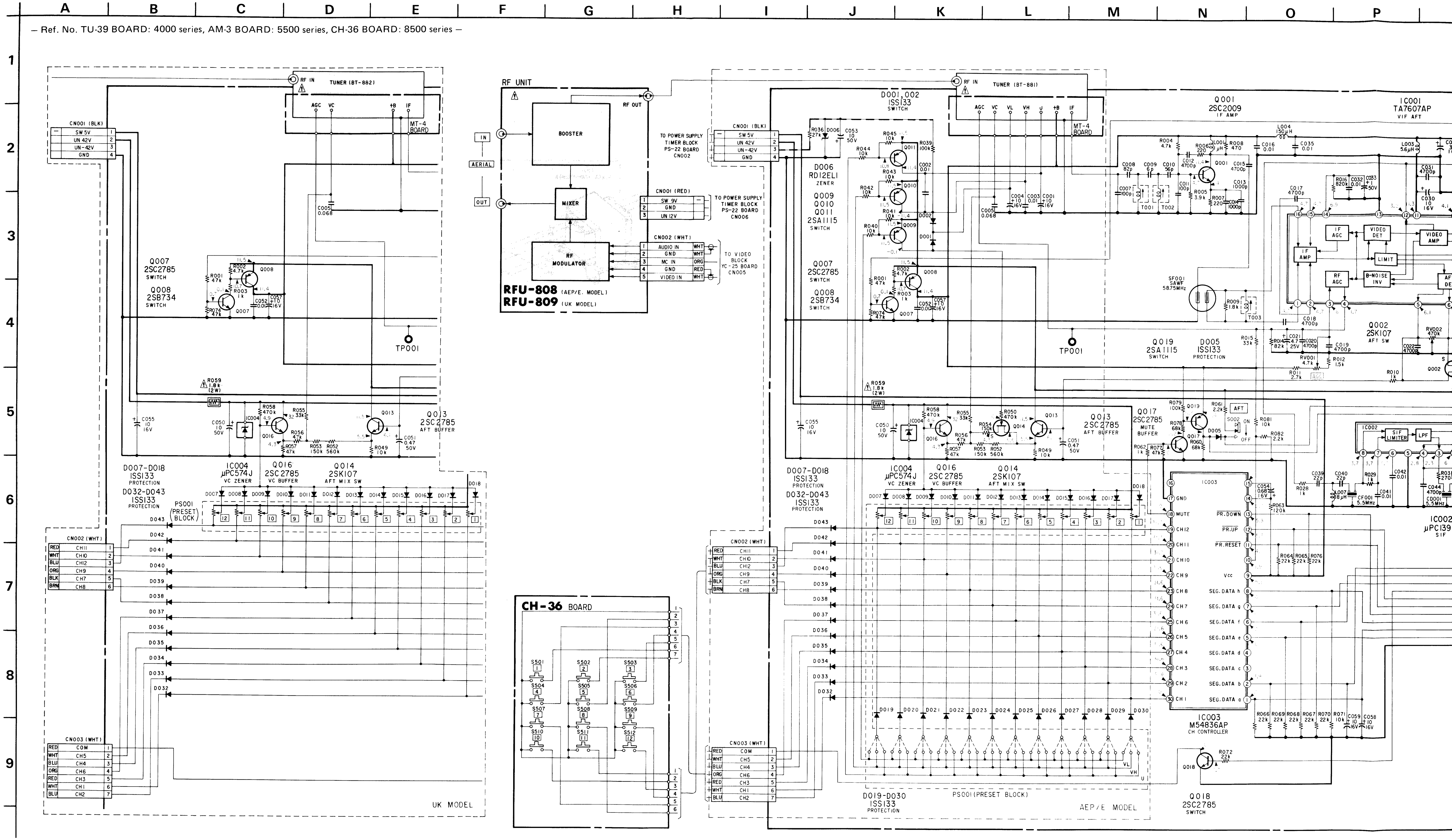
The voltage value is measured using a digital tester (10MΩ/V).

**Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

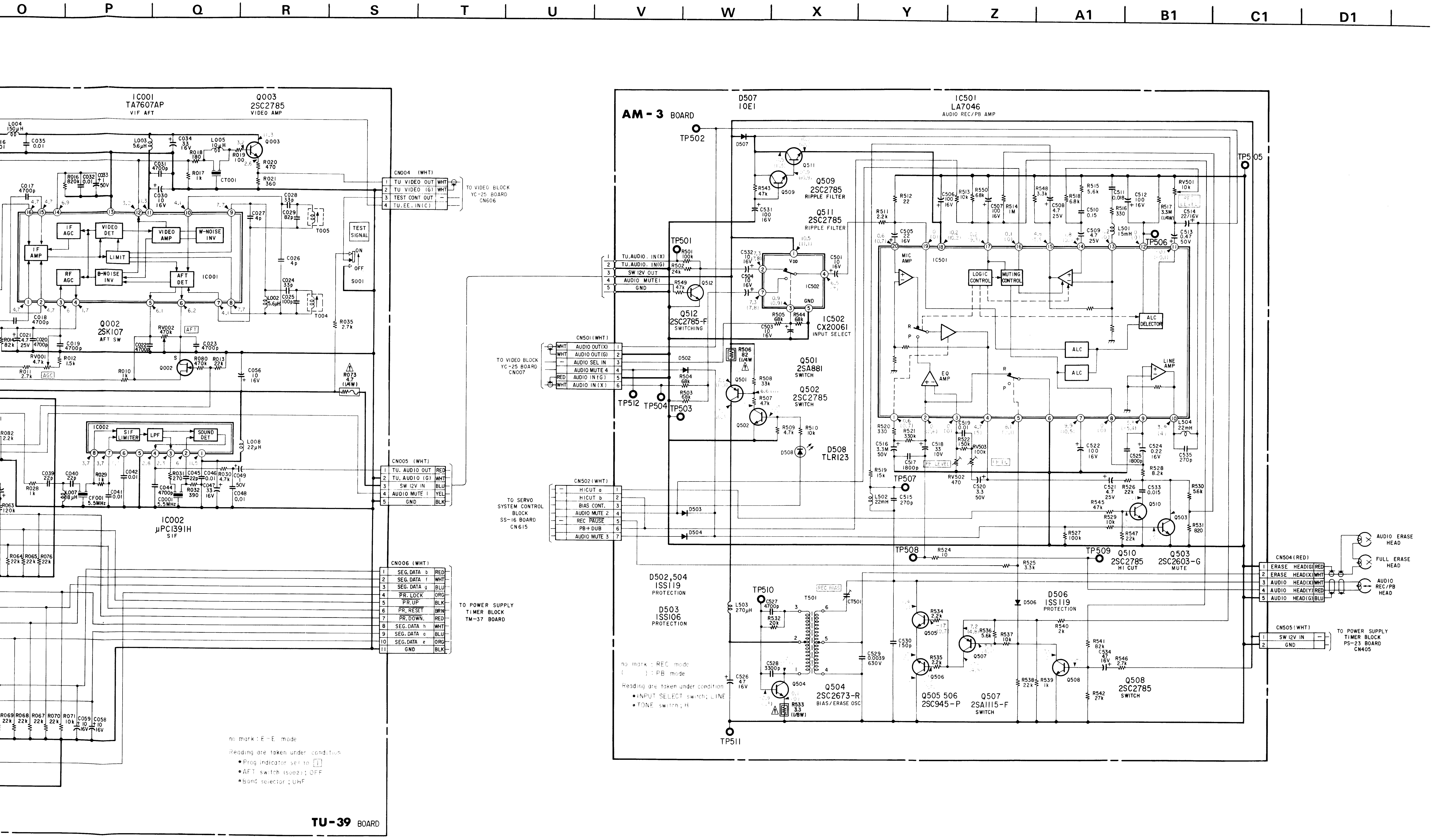
When indicating parts by reference number, please include the board name.

**TU-39** (VIF, SIF, AFC, CHANNEL PRESET) **AM-3** (AUDIO RECORD/ PLAY BACK PROCESS) **CH-36** (CHANNEL SWITCH) **MT-4** (INTERMEDIATION)

– Ref. No. TU-39 BOARD: 4000 series, AM-3 BOARD: 5500 series, CH-36 BOARD: 8500 series –



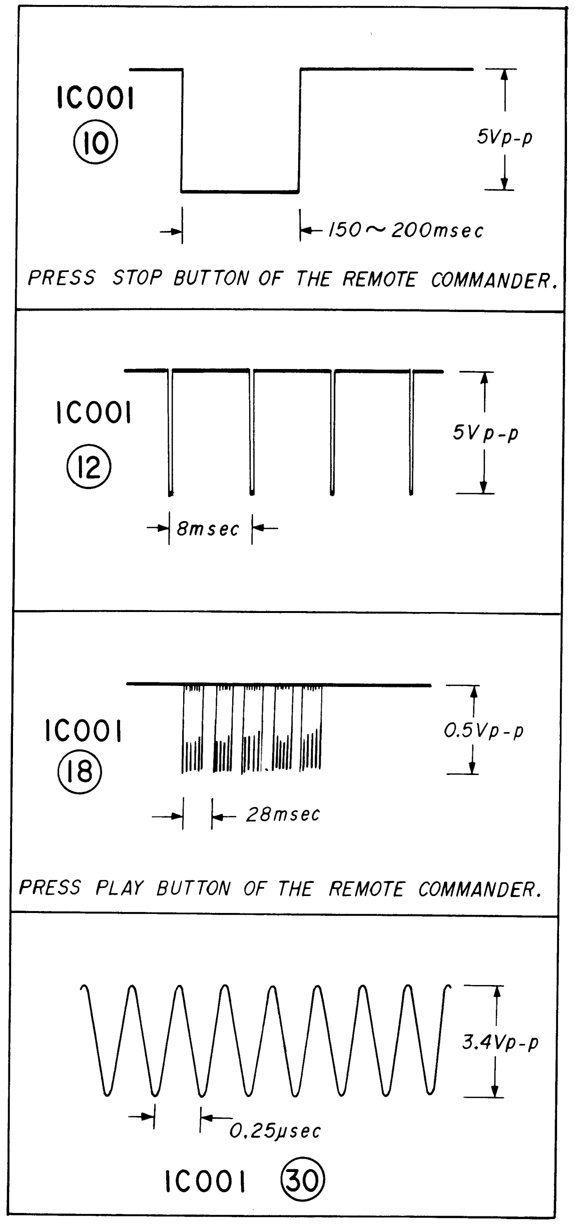
A B C D E F G H I J K L M N O P
1 2 3 4 5 6 7 8 9
TUNER (BT-882)
RF IN
AGC VC +B IF
MT-4 BOARD
CN001 (BLK)
SW 5V
UN 42V
UN -42V
GND
C005 0.068
Q007 2SC2785 SWITCH
Q008 2SB734 SWITCH
TP001
R059 1.8k (2W)
C055 10 16V
IC004 μPC574J VC ZENER
Q016 2SC2785 VC BUFFER
Q014 2SK107 AFT MIX SW
Q013 2SC2785 AFT BUFFER
D007-D018 1SS133 PROTECTION
D032-D043 1SS133 PROTECTION
PS001 (PRESET) BLOCK)
CN002 (WHT)
CH11 CH10 CH12 CH9 CH7 CH8
CN003 (WHT)
COM CH5 CH4 CH6 CH3 CH1 CH2
UK MODEL
RF UNIT
IN
AERIAL
OUT
BOOSTER
MIXER
RF MODULATOR
RF OUT
CN001 (RED)
SW 9V
GND
UN 12V
TO POWER SUPPLY TIMER BLOCK PS-22 BOARD CN006
CN002 (WHT)
AUDIO IN
MC IN
VIDEO IN
TO VIDEO BLOCK YC-25 BOARD CN005
RFU-808 (AEP/E. MODEL)
RFU-809 (UK MODEL)
CH-36 BOARD
S501 S502 S503 S504 S505 S506 S507 S508 S509 S510 S511 S512
TO POWER SUPPLY TIMER BLOCK PS-22 BOARD CN002
TUNER (BT-881)
AGC VC VL VH U +B IF
D001, 002 1SS133 SWITCH
D006 RD12EL1 ZENER
Q009 Q010 Q011 2SA1115 SWITCH
Q001 2SC2009 IF AMP
IC001 TA7607AP VIF AFT
IF AGC
VIDEO DET
VIDEO AMP
IF AMP
LIMIT
RF AGC
B-NOISE INV
SF001 SAWF 58.75MHz
T001 T002 T003
Q019 2SA1115 SWITCH
D005 1SS133 PROTECTION
Q002 2SK107 AFT SW
Q017 2SC2785 MUTE BUFFER
AFT
S002 ON OFF
IC002
SIF LIMITER
LPF
CF001 5.5MHz
CD001 5.5MHz
IC002 μPC1391 SIF
IC003
GND MUTE CH12 CH11 CH10 CH9 CH8 CH7 CH6 CH5 CH4 CH3 CH2 CH1
PR.DOWN PR.UP PR.RESET Vcc
SEG.DATA h SEG.DATA g SEG.DATA f SEG.DATA e SEG.DATA d SEG.DATA c SEG.DATA b SEG.DATA a
IC003 M54836AP CH CONTROLLER
Q018 2SC2785 SWITCH
D019-D030 1SS133 PROTECTION
PS001 (PRESET BLOCK)
AEP/E MODEL
VL VH U


O
P
Q
R
S
T
U
V
W
X
Y
Z
A1
B1
C1
D1
IC001
TA7607AP
VIF AFT
Q003
2SC2785
VIDEO AMP
L004 150μH
C035 0.01
L003 5.6μH
C034 33 16V
L005 10μH
R018 180
R019 100
R020 470
R021 360
CT001
R016 820k
C032 0.01
C033 1 50V
C017 4700p
C031 4700p
R017 1k
C030 10 16V
C028 33p
C029 82p
C027 4p
T005
IF AGC
VIDEO DET
VIDEO AMP
W-NOISE INV
IF AMP
LIMIT
RF AGC
B-NOISE INV
AFT DET
IC001
C026 4p
C024 33p
C025 100p
L002 5.6μH
T004
TEST SIGNAL
ON
OFF
S001
CN004 (WHT)
TU VIDEO OUT
TU VIDEO (G)
TEST CONT OUT
TU.EE. IN(C)
TO VIDEO BLOCK YC-25 BOARD CN606
C018 4700p
C021 4.7 25V
C020 4700p
R014 82k
Q002 2SK107 AFT SW
RV002 470k
AFT
C022 4700p
C023 4700p
C019 4700p
RV001 4.7k
R012 1.5k
R011 2.7k
AGC
R010 1k
Q002
R080 470k
R013 22k
C056 10 16V
R035 2.7k
R073 4.7 (1/4W)
R082 2.2k
IC002
SIF LIMITER
LPF
SOUND DET
L008 22μH
C039 22p
C040 22p
R029 1k
C042 0.01
R031 270
C045 22p
C046 0.01
R030 4.7k
C049 1 50V
R028 1k
L007 68μH
CF001 5.5MHz
C041 0.01
C044 4700p
R032 390
C047 33 16V
C048 0.01
CD001 5.5MHz
R063 120k
IC002
μPC1391H
SIF
CN005 (WHT)
TU. AUDIO OUT
TU. AUDIO (G)
SW 12V IN
AUDIO MUTE 1
GND
R064 22k
R065 22k
R076 22k
CN006 (WHT)
SEG. DATA b
SEG. DATA f
SEG. DATA g
PR. LOCK
PR. UP
PR. RESET
PR. DOWN.
SEG. DATA h
SEG. DATA a
SEG. DATA e
GND
RED
WHT
BLU
ORG
BLK
BRN
YEL
TO POWER SUPPLY TIMER BLOCK TM-37 BOARD
R069 22k
R068 22k
R067 22k
R070 22k
R071 10k
C059 10 16V
C058 10 16V
TU-39 BOARD
AM-3 BOARD
TP502
D507 10E1
D507
IC501
LA7046
AUDIO REC/PB AMP
Q511
Q509
R543 47k
Q509 2SC2785 RIPPLE FILTER
Q511 2SC2785 RIPPLE FILTER
C531 100 16V
TP505
R512 22
R511 2.2k
C505 22 16V
C506 100 16V
R513 10k
R550 68k
C507 100 16V
R514 1M
R548 3.3k
C508 4.7 25V
R518 6.8k
R515 5.6k
C510 0.15
C511 0.018
R516 330
C512 100 16V
C509 4.7 25V
L501 15mH
TP506
R517 3.3M (1/4W)
RV501 10k
C514 22/16V
C513 0.47 50V
TP501
R501 100k
R502 24k
C532 10 16V
C504 10 16V
C501 10 16V
VDD
IC502
GND
R549 47k
Q512
Q512 2SC2785-F SWITCHING
R505 68k
R544 68k
C503 10 16V
IC502 CX20061 INPUT SELECT
TU.AUDIO. IN(X)
TU.AUDIO. IN(G)
SW 12V OUT
AUDIO MUTE1
GND
MIC AMP
IC501
LOGIC CONTROL
MUTING CONTROL
ALC DELECTOR
ALC
ALC
LINE AMP
EQ AMP
R
P
CN501 (WHT)
AUDIO OUT(X)
AUDIO OUT(G)
AUDIO SEL IN
AUDIO MUTE 4
AUDIO IN(G)
AUDIO IN(X)
TO VIDEO BLOCK YC-25 BOARD CN007
D502
R506 82 (1/4W)
R504 68k
R503 68k
R508 33k
R507 4.7k
Q501
Q502
Q501 2SA881 SWITCH
Q502 2SC2785 SWITCH
TP512
TP504
TP503
R509 4.7k
R510 10k
D508
D508 TLR123
R520 330
R521 330k
C519 0.01
C516 3.3M 50V
C518 33 10V
R522 150k
RV503 100k
C517 1800p
PB LEVEL
REC LEVEL
R519 15k
TP507
RV502 470
C520 3.3 50V
L502 22mH
C515 270p
C522 100 16V
C525 1800p
C524 0.22 16V
C535 270p
L504 22mH
R528 8.2k
C521 4.7 25V
R526 22k
C533 0.015
R530 5.6k
R545 47k
R529 10k
Q510
Q503
R531 820
R527 100k
R547 22k
CN502 (WHT)
HICUT a
HICUT b
BIAS CONT.
AUDIO MUTE 2
REC PAUSE
PB+DUB
AUDIO MUTE 3
TO SERVO SYSTEM CONTROL BLOCK SS-16 BOARD CN615
D503
D504
TP508
R524 10
TP509
Q510 2SC2785 HI CUT
Q503 2SC2603-G MUTE
R525 3.3k
CN504 (RED)
ERASE HEAD(G)
ERASE HEAD(X)
AUDIO HEAD(X)
AUDIO HEAD(Y)
AUDIO HEAD(G)
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO REC/PB HEAD
D502,504 1SS119 PROTECTION
D503 1SS106 PROTECTION
TP510
REC BIAS
T501
CT501
L503 270μH
C527 4700p
R532 20k
C529 0.0039 630V
C530 150p
R534 2.2k
Q505
R536 5.6k
R537 10k
Q507
R535 2.2k
Q506
D506
D506 1SS119 PROTECTION
R540 2k
R541 82k
C534 47 16V
R546 2.7k
Q508
R538 22k
R539 1k
R542 27k
Q508 2SC2785 SWITCH
C528 3300p
C526 47 16V
Q504
R533 3.3 (1/8W)
Q504 2SC2673-R BIAS/ERASE OSC
Q505 506 2SC945-P
Q507 2SA1115-F SWITCH
CN505 (WHT)
SW 12V IN
GND
TO POWER SUPPLY TIMER BLOCK PS-23 BOARD CN405
TP511

no mark : E-E mode
Reading are taken under condition
● Prog indicator set to 1
● AFT switch (S002): OFF
● Band selector : UHF

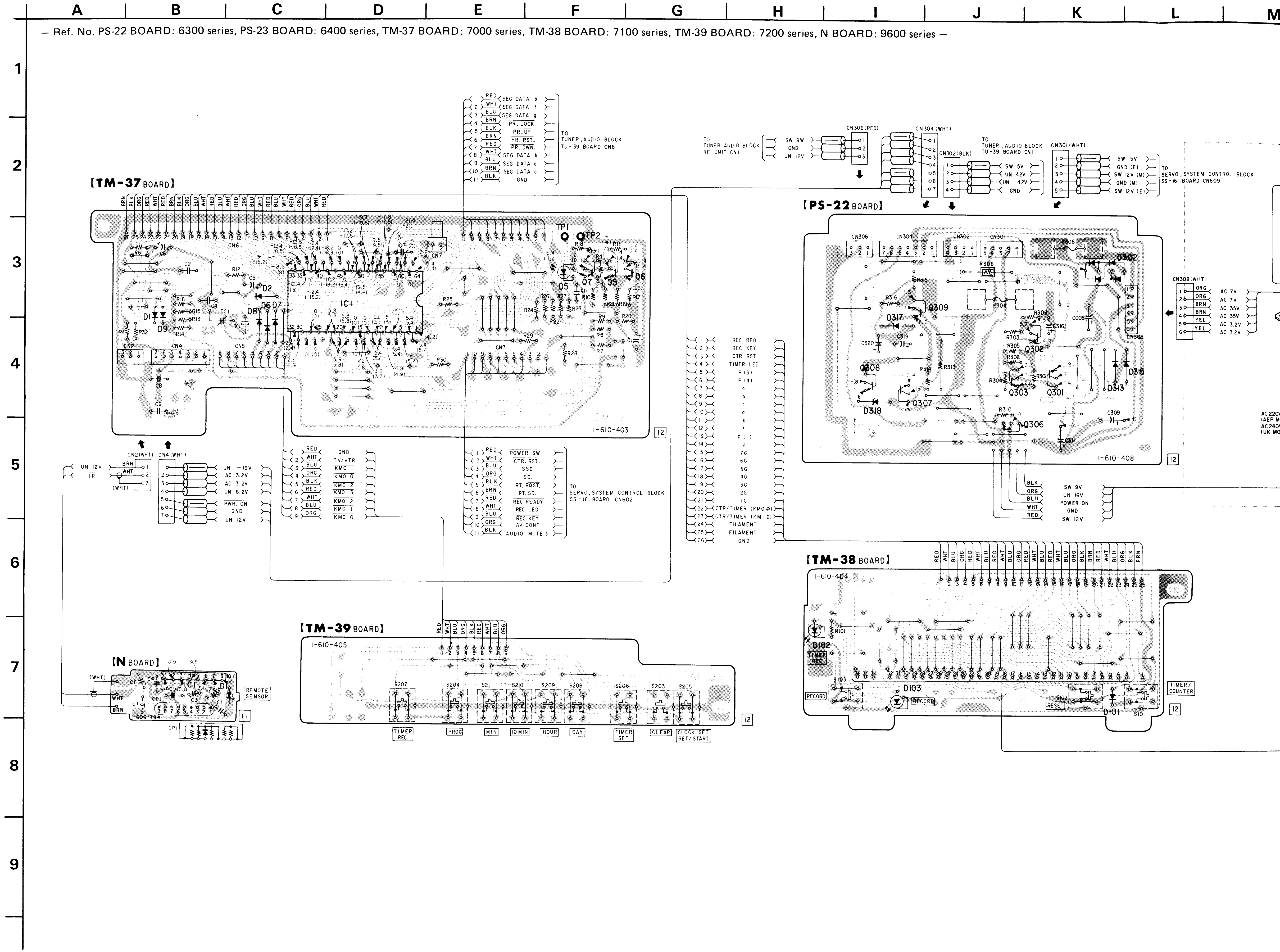
no mark : REC mode
( ) : PB mode
Reading are taken under condition
● INPUT SELECT switch: LINE
● TONE switch: H

## TM - 37 BOARD

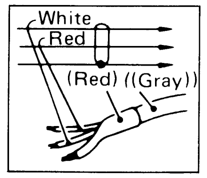


**PS-22** (POWER SUPPLY REGULATOR) **PS-23** (POWER SUPPLY REGULATOR) **TM-37** (TIMER CONTROL) **TM-38** (TIMER INDICATOR REC RESET TIMER COUNTER SWITCH) **TM-39** (TIMER PRESET SWITCH) **N** (REMOTE CONTROL SIGNAL SENSOR)

– Ref. No. PS-22 BOARD: 6300 series, PS-23 BOARD: 6400 series, TM-37 BOARD: 7000 series, TM-38 BOARD: 7100 series, TM-39 BOARD: 7200 series, N BOARD: 9600 series –

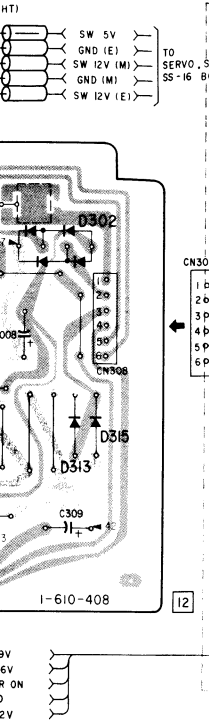

A
B
C
D
E
F
G
H
I
J
K
L
M
1
2
3
4
5
6
7
8
9
[TM-37 BOARD]
1-610-403
SEG DATA b
SEG DATA f
SEG DATA g
PR. LOCK
PR. UP
PR. RST.
PR. DWN.
SEG DATA h
SEG DATA a
SEG DATA e
GND
TO TUNER, AUDIO BLOCK TU-39 BOARD CN6
TP1
TP2
IC1
CN2(WHT)
CN4(WHT)
CN5
CN6
CN7
CN3
UN 12V
IR
UN -19V
AC 3.2V
AC 3.2V
UN 6.2V
PWR. ON
GND
UN 12V
GND
TV/VTR
KMO 1
KMO 0
KMO 2
KMO 3
KMO 2
KMO 1
KMO 0
POWER SW
CTR. RST.
SSD
SC
RT. RQST.
RT. SD.
REC READY
REC LED
REC KEY
AV CONT
AUDIO MUTE 3
TO SERVO, SYSTEM CONTROL BLOCK SS-16 BOARD CN602
REC RED
REC KEY
CTR RST
TIMER LED
CTR/TIMER (KMO φ)
CTR/TIMER (KM1 2)
FILAMENT
FILAMENT
GND
TO TUNER AUDIO BLOCK RF UNIT CN1
SW 9V
GND
UN 12V
CN306(RED)
CN304(WHT)
CN302(BLK)
TO TUNER, AUDIO BLOCK TU-39 BOARD CN1
SW 5V
UN 42V
UN -42V
GND
CN301(WHT)
SW 5V
GND (E)
SW 12V (M)
GND (M)
SW 12V (E)
TO SERVO, SYSTEM CONTROL BLOCK SS-16 BOARD CN609
[PS-22 BOARD]
1-610-408
CN308(WHT)
AC 7V
AC 7V
AC 35V
AC 35V
AC 3.2V
AC 3.2V
AC220V (AEP M
AC240V (UK MO
SW 9V
UN 16V
POWER ON
GND
SW 12V
[TM-38 BOARD]
1-610-404
D102
TIMER REC
D103
RECORD
RESET
D101
S101
S102
S103
TIMER/COUNTER
[TM-39 BOARD]
1-610-405
S207
S204
S211
S210
S209
S208
S206
S203
S205
TIMER REC
PROG
MIN
10MIN
HOUR
DAY
TIMER SET
CLEAR
CLOCK SET SET/START
[N BOARD]
REMOTE SENSOR
1-606-794

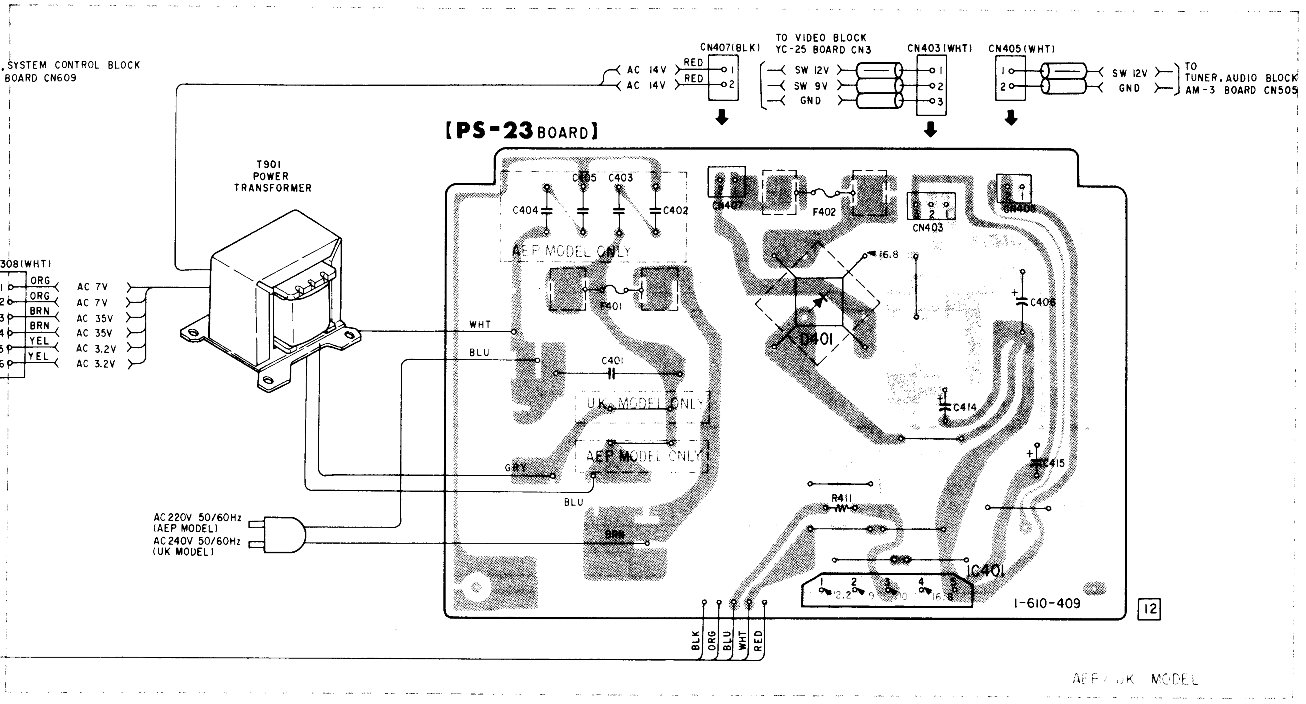
- Color code of sleeving over the end of the jacket.

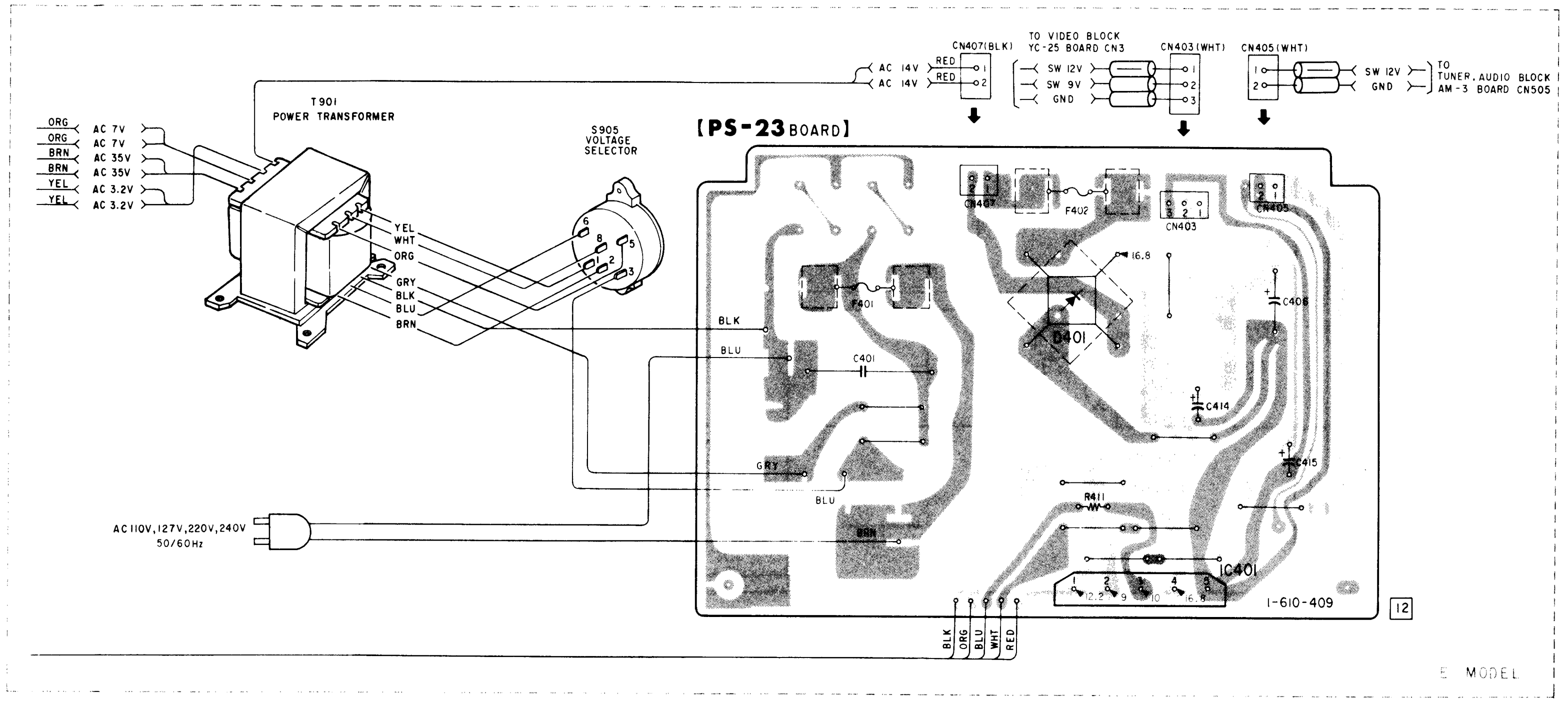

White
Red
(Red) ((Gray))

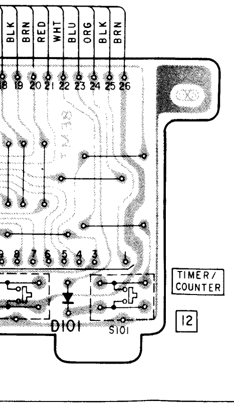
- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- ▨ Soldering side
- ▨ B + pattern

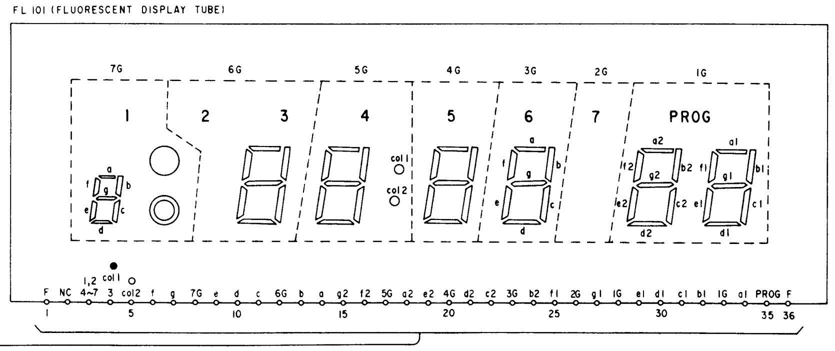
T **N** (REMOTE CONTROL SIGNAL SENSOR)


SW 5V
GND (E)
SW 12V (M)
GND (M)
SW 12V (E)
TO SERVO, SYSTEM CONTROL BLOCK SS-16 BOARD CN609
D302
D315
D313
C309
1-610-408
12
9V
6V
R ON
2V


CN308(WHT)
ORG
ORG
BRN
BRN
YEL
YEL
AC 7V
AC 7V
AC 35V
AC 35V
AC 3.2V
AC 3.2V
T901 POWER TRANSFORMER
CN407(BLK)
AC 14V
AC 14V
RED
RED
TO VIDEO BLOCK YC-25 BOARD CN3
SW 12V
SW 9V
GND
CN403(WHT)
CN405(WHT)
SW 12V
GND
TO TUNER, AUDIO BLOCK AM-3 BOARD CN505
[PS-23 BOARD]
C404
C405
C403
C402
AEP MODEL ONLY
CN407
F402
CN403
CN405
F401
D401
16.8
C406
WHT
BLU
C401
U.K. MODEL ONLY
AEP MODEL ONLY
C414
C415
GRY
BLU
BRN
R411
IC401
AC220V 50/60Hz (AEP MODEL)
AC240V 50/60Hz (UK MODEL)
1-610-409
12
BLK
ORG
BLU
WHT
RED
AEP/UK MODEL

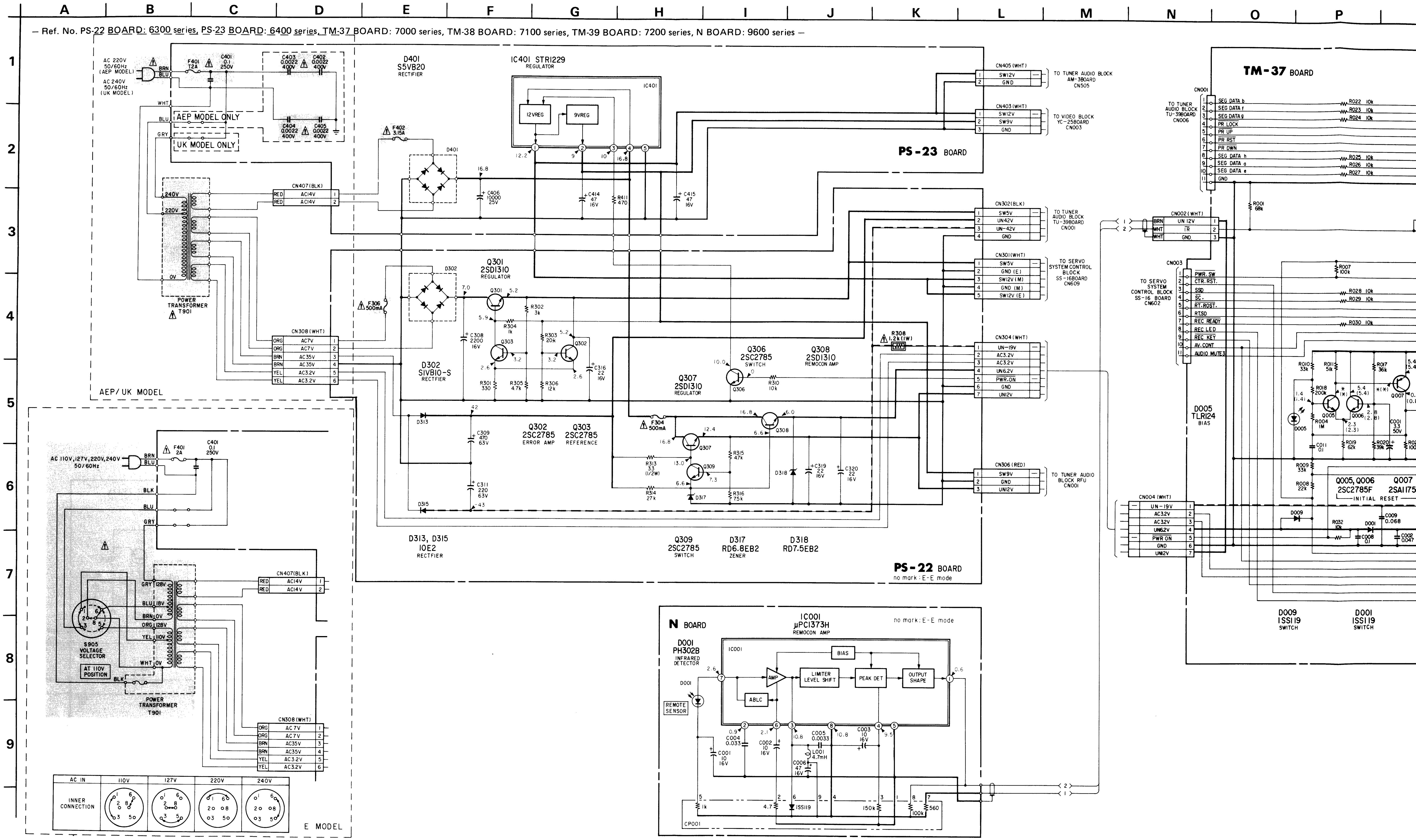

ORG
ORG
BRN
BRN
YEL
YEL
AC 7V
AC 7V
AC 35V
AC 35V
AC 3.2V
AC 3.2V
T901 POWER TRANSFORMER
S905 VOLTAGE SELECTOR
YEL
WHT
ORG
GRY
BLK
BLU
BRN
CN407(BLK)
AC 14V
AC 14V
RED
RED
TO VIDEO BLOCK YC-25 BOARD CN3
SW 12V
SW 9V
GND
CN403(WHT)
CN405(WHT)
SW 12V
GND
TO TUNER, AUDIO BLOCK AM-3 BOARD CN505
[PS-23 BOARD]
CN407
F402
CN403
CN405
F401
D401
16.8
C406
BLK
BLU
C401
C414
C415
GRY
BLU
BRN
R411
IC401
AC110V, 127V, 220V, 240V 50/60Hz
1-610-409
12
BLK
ORG
BLU
WHT
RED
E MODEL

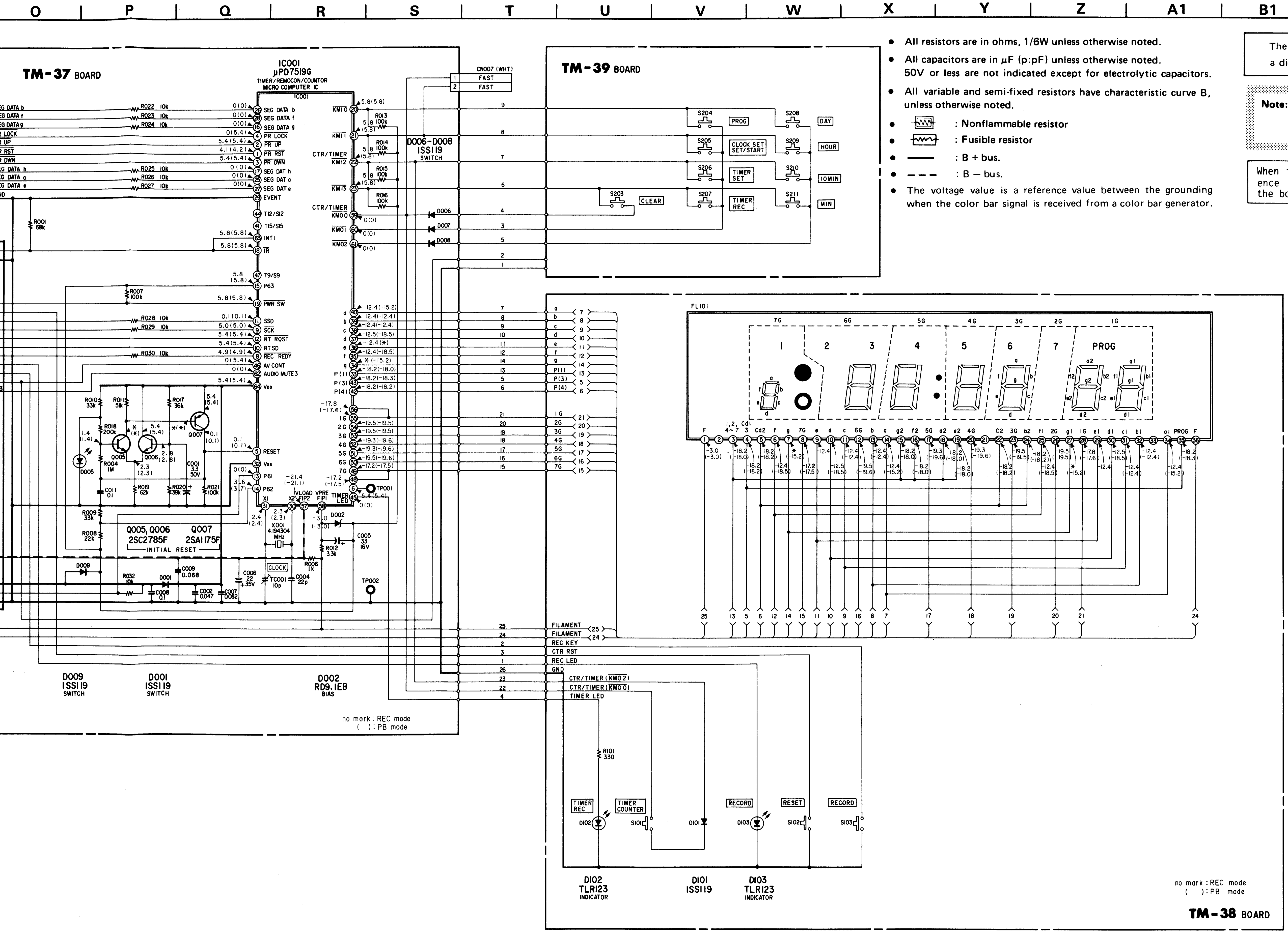

BLK
BRN
RED
WHT
BLU
ORG
BLK
BRN
D101
S101
TIMER/COUNTER
12


FL101 (FLUORESCENT DISPLAY TUBE)
7G
6G
5G
4G
3G
2G
1G
1
2
3
4
5
6
7
PROG
col 1
col 2
1,2 col 1
F NC 4~7 3 col2 f g 7G e d c 6G b a g2 f2 5G a2 e2 4G d2 c2 3G b2 f1 2G g1 1G e1 d1 c1 b1 1G a1 PROG F
1 5 10 15 20 25 30 35 36

**PS-22** (POWER SUPPLY REGULATOR) **PS-23** (POWER SUPPLY REGULATOR) **TM-37** (TIMER CONTROL) **TM-38** (TIMER INDICATOR REC RESET TIMER COUNTER SWITCH) **TM-39** (TIMER PRESET SWITCH) **N** (REMOTE CONTROL SIGNAL SENSOR)

– Ref. No. PS-22 BOARD: 6300 series, PS-23 BOARD: 6400 series, TM-37 BOARD: 7000 series, TM-38 BOARD: 7100 series, TM-39 BOARD: 7200 series, N BOARD: 9600 series –


A B C D E F G H I J K L M N O P
1 2 3 4 5 6 7 8 9
AC 220V 50/60Hz (AEP MODEL)
AC 240V 50/60Hz (UK MODEL)
F401 T2A
C401 0.1 250V
C403 0.0022 400V
C402 0.0022 400V
C404 0.0022 400V
C405 0.0022 400V
AEP MODEL ONLY
UK MODEL ONLY
BRN BLU WHT GRY
240V 220V 0V
POWER TRANSFORMER T901
AEP/UK MODEL
D401 S5VB20 RECTIFIER
F402 3.15A
C406 10000 25V
IC401 STR1229 REGULATOR
12VREG
9VREG
C414 47 16V
R411 470
C415 47 16V
PS-23 BOARD
CN405 (WHT) SW12V GND
TO TUNER AUDIO BLOCK AM-38BOARD CN505
CN403 (WHT) SW12V SW9V GND
TO VIDEO BLOCK YC-25BOARD CN003
CN407 (BLK) AC14V AC14V
CN302 (BLK) SW5V UN42V UN-42V GND
TO TUNER AUDIO BLOCK TU-39BOARD CN001
CN301 (WHT) SW5V GND (E) SW12V (M) GND (M) SW12V (E)
TO SERVO SYSTEM CONTROL BLOCK SS-16BOARD CN609
D302
F306 500mA
Q301 2SD1310 REGULATOR
R302 3k
R304 1k
R303 20k
C308 2200 16V
C316 22 16V
R301 330
R305 4.7k
R306 12k
D302 S1VB10-S RECTFIER
CN308 (WHT) AC7V AC7V AC35V AC35V AC3.2V AC3.2V
ORG ORG BRN BRN YEL YEL
Q306 2SC2785 SWITCH
Q308 2SD1310 REMOCON AMP
Q307 2SD1310 REGULATOR
R308 1.2k (1W)
R310 10k
CN304 (WHT) UN-19V AC3.2V AC3.2V UN6.2V PWR.ON GND UN12V
D313
C309 470 63V
C311 220 63V
D315
Q302 2SC2785 ERROR AMP
Q303 2SC2785 REFERENCE
F304 500mA
R313 33 (1/2W)
R314 27k
R315 47k
R316 75k
D317
D318
C319 22 16V
C320 22 16V
CN306 (RED) SW9V GND UN12V
TO TUNER AUDIO BLOCK RFU CN001
D313, D315 10E2 RECTFIER
Q309 2SC2785 SWITCH
D317 RD6.8EB2 ZENER
D318 RD7.5EB2
PS-22 BOARD
no mark : E-E mode
AC 110V, 127V, 220V, 240V 50/60Hz
F401 2A
C401 0.1 250V
BLK BLU GRY
128V 18V 0V 128V 110V 0V
S905 VOLTAGE SELECTOR
AT 110V POSITION
POWER TRANSFORMER T901
CN407 (BLK) AC14V AC14V
CN308 (WHT) AC7V AC7V AC35V AC35V AC3.2V AC3.2V
AC IN 110V 127V 220V 240V
INNER CONNECTION
E MODEL
N BOARD
IC001 µPC1373H REMOCON AMP
no mark : E-E mode
D001 PH302B INFRARED DETECTOR
REMOTE SENSOR
AMP ABLC LIMITER LEVEL SHIFT PEAK DET OUTPUT SHAPE BIAS
C001 10 16V
C004 0.033
C002 10 16V
C005 0.0033
L001 4.7mH
C006 47 16V
C003 10 16V
1SS119
CP001
TM-37 BOARD
CN001
TO TUNER AUDIO BLOCK TU-39BOARD CN006
SEG DATA b, SEG DATA f, SEG DATA g, PR LOCK, PR UP, PR RST, PR DWN, SEG DATA h, SEG DATA a, SEG DATA e, GND
R022 10k R023 10k R024 10k R025 10k R026 10k R027 10k
R001 68k
CN002 (WHT) UN 12V IR GND
CN003
TO SERVO SYSTEM CONTROL BLOCK SS-16 BOARD CN602
PWR.SW CTR.RST. SSD SC. RT-RST. RTSD REC READY REC LED REC KEY AV.CONT AUDIO MUTE
R007 100k R028 10k R029 10k R030 10k
D005 TLR124 BIAS
Q005, Q006 2SC2785F
Q007 2SA1175
INITIAL RESET
CN004 (WHT) UN-19V AC3.2V AC3.2V UN6.2V PWR ON GND UN12V
D009 1SS119 SWITCH
D001 1SS119 SWITCH
C009 0.068
C008 0.1


O P Q R S T U V W X Y Z A1 B1 C1 D1 E1
TM-37 BOARD
IC001
μPD75196
TIMER/REMOCON/COUNTOR MICRO COMPUTER IC
SEG DATA b
SEG DATA f
SEG DATA g
PR LOCK
PR UP
PR RST
PR DWN
SEG DAT h
SEG DAT a
SEG DAT e
EVENT
T12/SI2
T15/SI5
INT1
IR
T9/S9
P63
PWR SW
SSD
SCK
RT RQST
RT SD
REC REDY
AV CONT
AUDIO MUTE 3
VDD
RESET
VSS
P61
P62
X1
X2
VLOAD FIP2
VPRE FIP1
TIMER LED
KMI0
KMI1
CTR/TIMER KMI2
KMI3
CTR/TIMER KMO0
KMO1
KMO2
CN007 (WHT)
FAST
D006-D008
1SS119
SWITCH
Q005, Q006
2SC2785F
Q007
2SA1175F
INITIAL RESET
X001
4.194304 MHz
CLOCK
TP001
TP002
D009
1SS119
SWITCH
D001
1SS119
SWITCH
D002
RD9.1EB
BIAS
no mark : REC mode
( ) : PB mode
TM-39 BOARD
S204 PROG
S205 CLOCK SET SET/START
S206 TIMER SET
S207 TIMER REC
S203 CLEAR
S208 DAY
S209 HOUR
S210 10MIN
S211 MIN
FL101
PROG
FILAMENT
REC KEY
CTR RST
REC LED
GND
CTR/TIMER (KMO2)
CTR/TIMER (KMO0)
TIMER LED
R101 330
TIMER REC
TIMER COUNTER
RECORD
RESET
D102
TLR123
INDICATOR
D101
1SS119
D103
TLR123
INDICATOR
S101
S102
S103
no mark : REC mode
( ) : PB mode
TM-38 BOARD

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▨ : Nonflammable resistor
- ∿ : Fusible resistor
- ——— : B + bus.
- - - - : B − bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

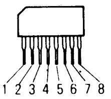
The voltage value is measured using a digital tester (10MΩ/V).

**Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

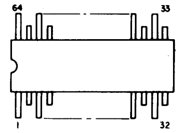
When indicating parts by reference number, please include the board name.

## SEMICONDUCTORS

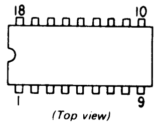
µPC1391H CX20008
µPC1373 CX20016
CX7926 CX20061



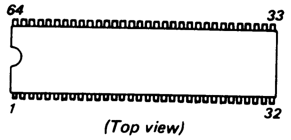
µPD7519



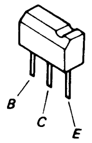
CX882


18
10
1
9
(Top view)

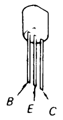
MB88421


64
33
1
32
(Top view)

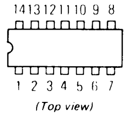
2SA874
2SA881
2SC2673



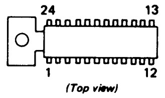
2SC2009



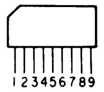
µPC324C MB84013B
µPD4013BC MB84069UBP
HD14069UBP TC4013BP
MB3614 TC4069UBP


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

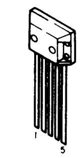
CX134A
CX135


24
13
1
12
(Top view)

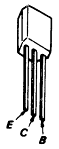
CX894
TA7320P



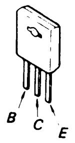
STR1229



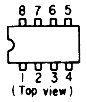
2SA1048
2SA1115
2SC403SP
2SC2458
2SC2603



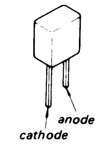
2SD1310



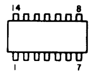
µPC358C
µPC4558C
NJM4558D


8 7 6 5
1 2 3 4
(Top view)

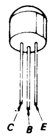
CX194B-0


anode
cathode

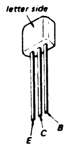
CX7945



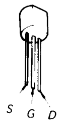
TA7607



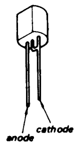
2SA1175
2SC2785


letter side
E
C
B

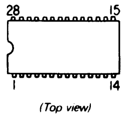
2SK107



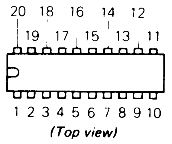
µPC574


anode
cathode

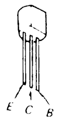
CX862
CX869


28
15
1
14
(Top view)

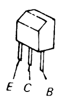
LA7046


20 18 16 14 12
19 17 15 13 11
1 2 3 4 5 6 7 8 9 10
(Top view)

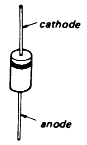
2SA772 2SC1475
2SB739 2SD788
2SB740 2SD789
2SC1474



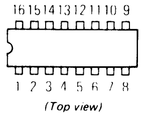
2SB733
2SB734
2SD773
2SD774



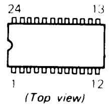
10E-1
10E-2


cathode
anode

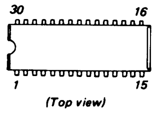
µPD4053BC
CX870A
MB84053B
TC4053BP


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

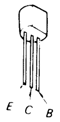
CX864
CX867
CX868


24
13
1
12
(Top view)

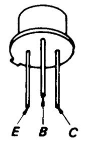
M54836


30
16
1
15
(Top view)

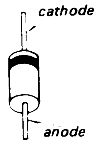
2SA844
2SC945



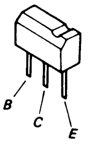
2SC1061
2SC1826
2SC1827



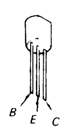
1S1555 RD7.5EB1
1S2076 RD7.5EB2
1S2473 RD9.1E-B
1SS106 RD10EB1
1SS133 RD10EB2
RD5.6EB1 RD12EL1
RD6.2E-B RD12EL2
RD6.8EB2 RD12EL3


cathode
anode

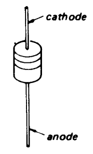
**2SA874**
**2SA881**
**2SC2673**



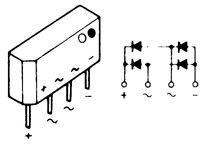
**2SC2009**



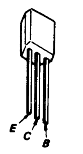
**1SS119**
**1SS148**


cathode
anode

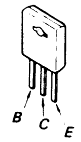
**S1VB10**



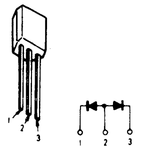
**2SA1048**
**2SA1115**
**2SC403SP**
**2SC2458**
**2SC2603**



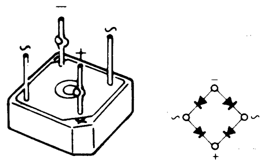
**2SD1310**



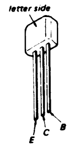
**MC911**



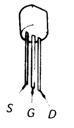
**S5VB20**



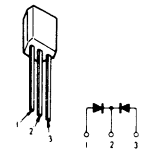
**2SA1175**
**2SC2785**


letter side
E
C
B

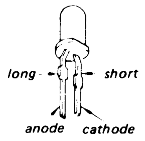
**2SK107**



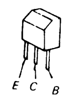
**MC921**



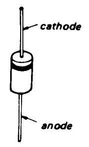
**TLG123A**
**TLO123**
**TLR123**
**TLR124**
**TLY123**


long
short
anode
cathode

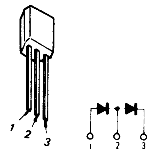
**2SB733**
**2SB734**
**2SD773**
**2SD774**



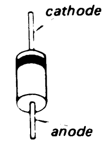
**10E-1**
**10E-2**


cathode
anode

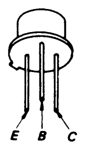
**MC931**



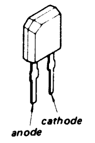
**1S1555**
**1S2076**
**1S2473**
**1SS106**
**1SS133**
**RD5.6EB1**
**RD6.2E-B**
**RD6.8EB2**
**RD7.5EB1**
**RD7.5EB2**
**RD9.1E-B**
**RD10EB1**
**RD10EB2**
**RD12EL1**
**RD12EL2**
**RD12EL3**


cathode
anode

**2SC1061**
**2SC1826**
**2SC1827**

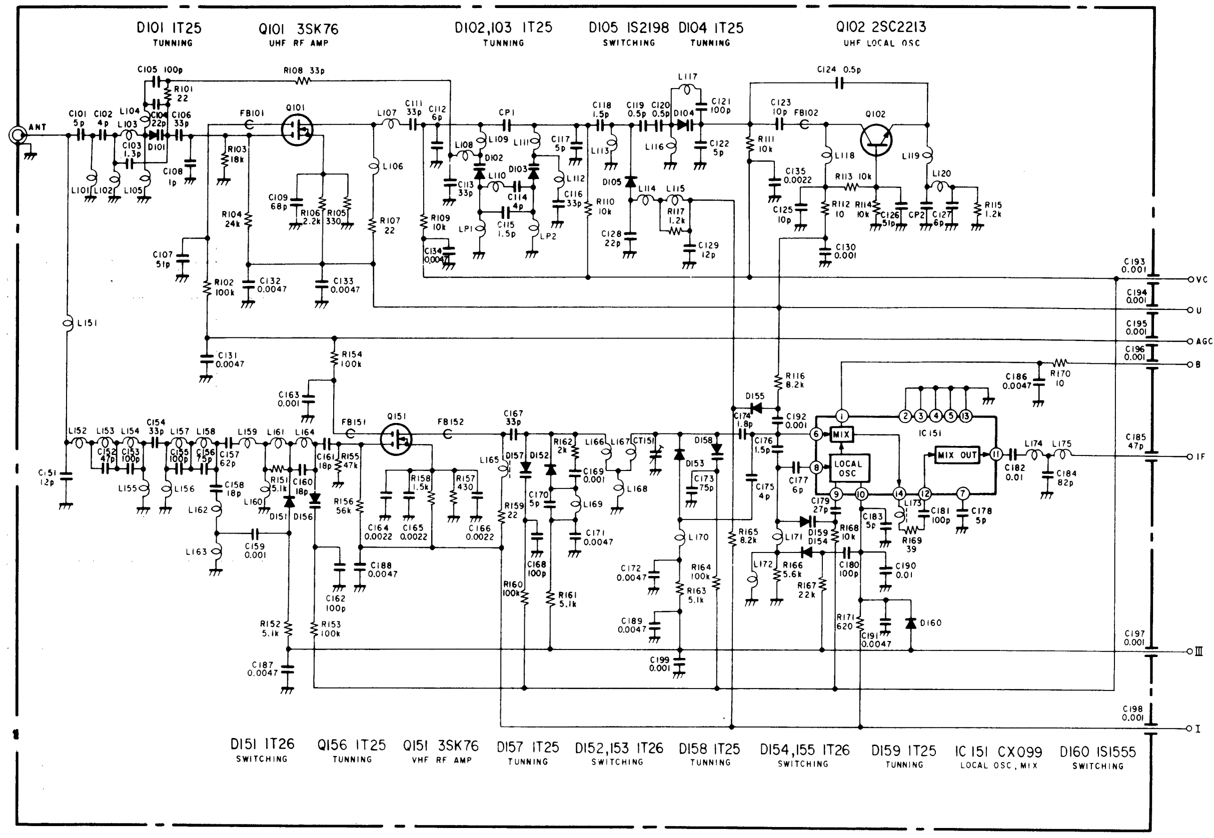


**PH302B**

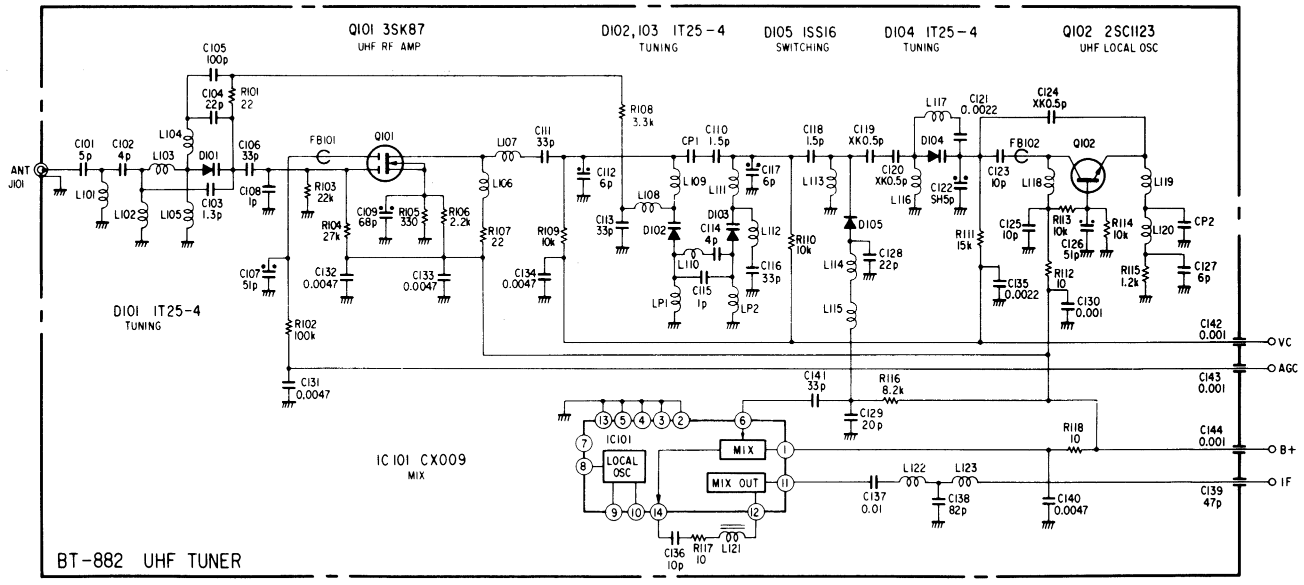

cathode
anode

## VHF/UHF TUNER SCHEMATIC DIAGRAM

- **BT-881 (AEP, E model)**


D101 1T25 TUNING
Q101 3SK76 UHF RF AMP
D102,103 1T25 TUNING
D105 1S2198 SWITCHING
D104 1T25 TUNING
Q102 2SC2213 UHF LOCAL OSC
ANT
VC
U
AGC
B
IF
III
I
MIX
LOCAL OSC
MIX OUT
IC151
D151 1T26 SWITCHING
Q156 1T25 TUNING
Q151 3SK76 VHF RF AMP
D157 1T25 TUNING
D152,153 1T26 SWITCHING
D158 1T25 TUNING
D154,155 1T26 SWITCHING
D159 1T25 TUNING
IC 151 CX099 LOCAL OSC, MIX
D160 1S1555 SWITCHING

- **BT-882 (UK model)**

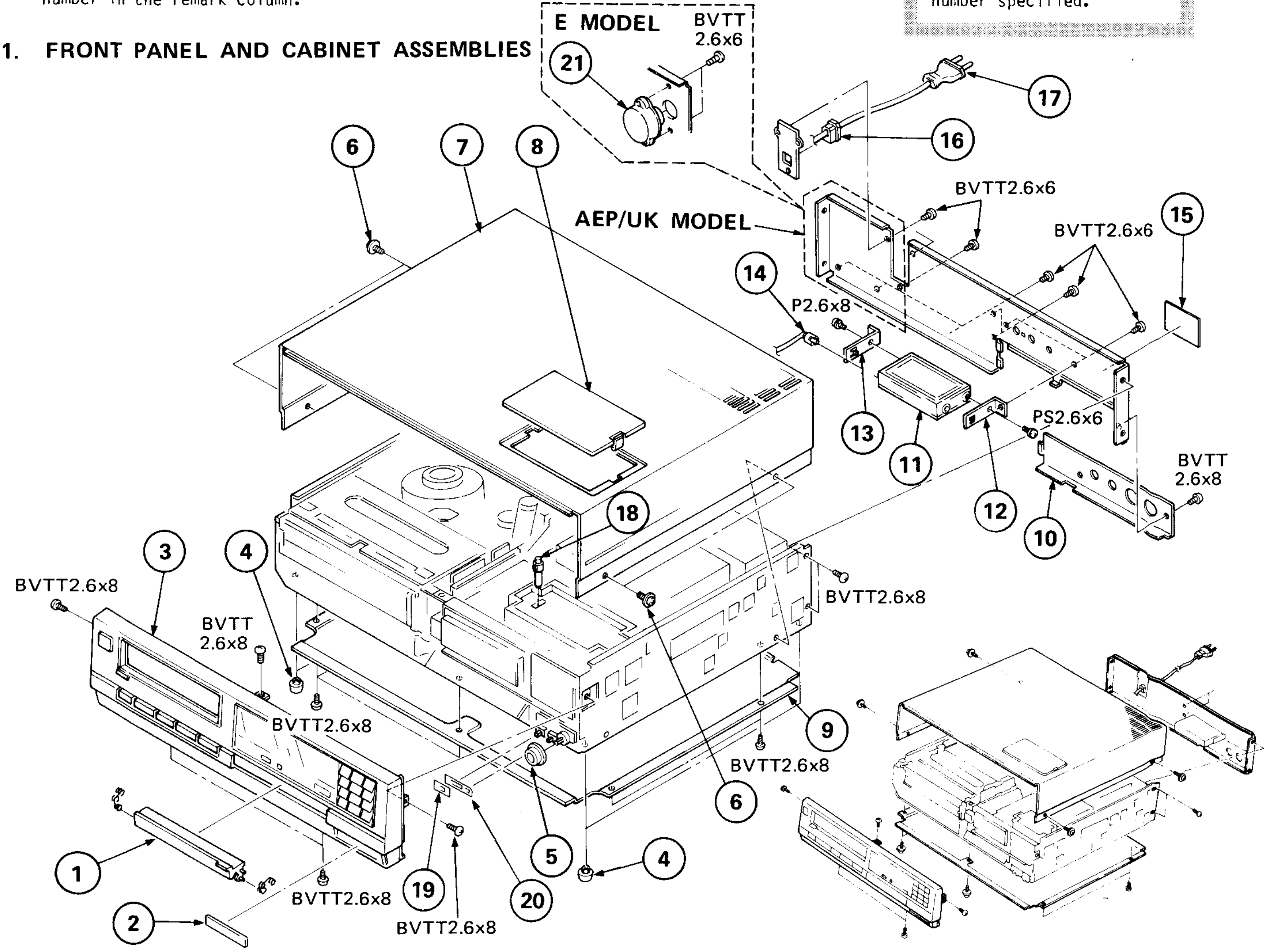

Q101 3SK87 UHF RF AMP
D102,103 1T25-4 TUNING
D105 1SS16 SWITCHING
D104 1T25-4 TUNING
Q102 2SC1123 UHF LOCAL OSC
ANT J101
D101 1T25-4 TUNING
IC 101 CX009 MIX
LOCAL OSC
MIX
MIX OUT
VC
AGC
B+
IF
BT-882 UHF TUNER

# SECTION 4
# EXPLODED VIEW

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

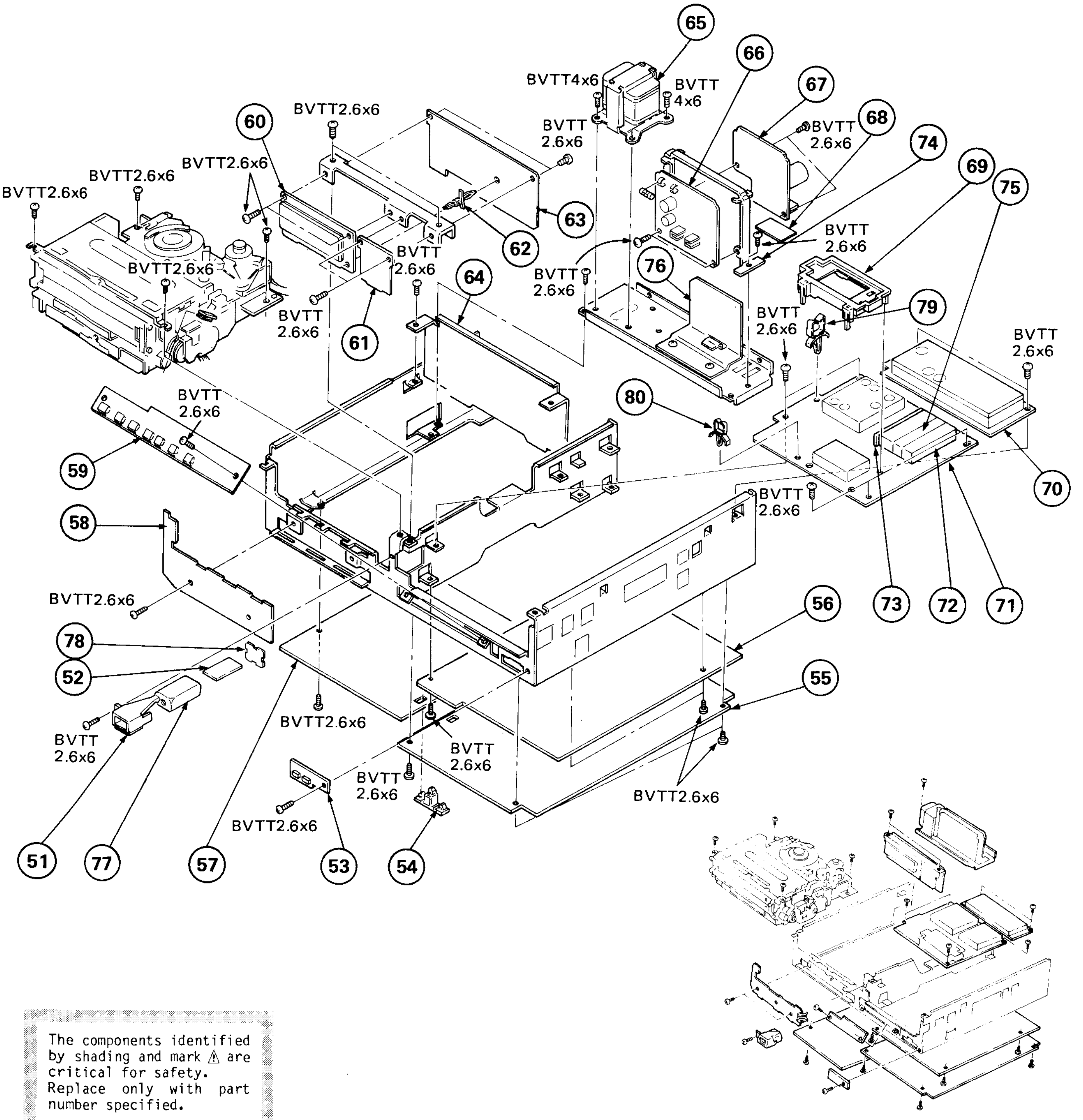
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

## 1. FRONT PANEL AND CABINET ASSEMBLIES



| No. | Part No. | Description | Remark |
|---|---|---|---|
| 1 | X-3681-102-0 | DOOR ASSY, TIMER (AEP MODEL/SILVER) (E MODEL) | |
| | X-3681-110-0 | DOOR ASSY, TIMER (AEP MODEL/GRAY) | |
| | X-3681-112-0 | DOOR ASSY, TIMER (UK MODEL) | |
| | X-3681-141-0 | DOOR ASSY, TIMER (AEP MODEL/RED) | |
| | X-3681-144-0 | DOOR ASSY, TIMER (AEP MODEL/WHITE) | |
| 2 | 3-681-110-02 | LABEL, TRACK CONTROL | |
| 3 | A-6703-325-A | PANEL BLOCK ASSY, FRONT (AEP MODEL/SILVER)(E MODEL) | 1,2 |
| | A-6703-342-A | PANEL BLOCK ASSY, FRONT (AEP MODEL/GRAY) | |
| | A-6703-343-A | PANEL BLOCK ASSY, FRONT (UK MODEL) | |
| | A-6703-384-A | PANEL BLOCK ASSY, FRONT (AEP MODEL/RED) | |
| | A-6703-383-A | PANEL BLOCK ASSY, FRONT (AEP MODEL/WHITE) | |
| 4 | 3-670-155-00 | LEG | |
| 5 | 3-681-118-02 | KNOB, TRACK CONTROL | |
| 6 | 3-703-354-01 | SCREW (OS), CASE, CLAW | |
| 7 | X-3681-116-0 | CASE ASSY, UPPER (UK MODEL) | |
| | X-3681-117-0 | CASE ASSY, UPPER (AEP MODEL/GRAY) | |
| | X-3681-118-0 | CASE ASSY, UPPER (AEP MODEL/SILVER) (E MODEL) | |
| | X-3681-140-0 | CASE ASSY, UPPER (AEP MODEL/RED) | |
| | X-3681-143-0 | CASE ASSY, UPPER (AEP MODEL/WHITE) | |
| 8 | X-3681-119-0 | DOOR ASSY, PRESET (AEP MODEL/SILVER) (E MODEL) | |
| | X-3681-120-0 | DOOR ASSY, PRESET (UK MODEL) | |
| | X-3681-121-0 | DOOR ASSY, PRESET (AEP MODEL/GRAY) | |
| | X-3681-139-0 | DOOR ASSY, PRESET (AEP MODEL/RED) | |
| | X-3681-146-0 | DOOR ASSY, PRESET (AEP MODEL/WHITE) | |
| 9 | 3-681-152-02 | PLATE, BOTTOM | |
| 10 | ♦:3-681-114-00 | PANEL, CONNECTOR | |
| 11 | ⚠1-464-270-00 | BOOSTER, RF MODULATOR(RFU-808) (AEP, E MODEL) | |
| | ⚠1-464-274-00 | BOOSTER, RF MODULATOR(RFU-809)(UK MODEL) | |
| 12 | ♦:3-681-101-00 | BRACKET (RIGHT), RBM | |
| 13 | ♦:3-681-102-00 | BRACKET (LEFT), RBM | |
| 14 | ♦:1-556-934-00 | CABLE, PIN | |
| 15 | ♦:3-681-169-00 | LABEL, MODEL NUMBER (AEP MODEL) | |
| | ♦:3-681-185-00 | LABEL, MODEL NUMBER (UK MODEL) | |
| | ♦:3-681-196-00 | LABEL, MODEL NUMBER (E MODEL) | |
| 16 | ⚠3-703-244-00 | BUSHING, CORD | |
| 17 | ⚠1-534-817-XX | CORD, POWER (AEP,E MODEL) | |
| | ⚠1-551-884-00 | CORD, POWER (UK MODEL) | |
| 18 | 3-681-186-00 | KNOB, TUNING | |
| 19 | 3-681-167-00 | COVER (SMALL), SL | |
| 20 | 3-681-166-00 | COVER (LARGE), SL | |
| 21 | ⚠.1-552-304-00 | SWITCH, VOLTAGE SELECTOR (E MODEL) | |

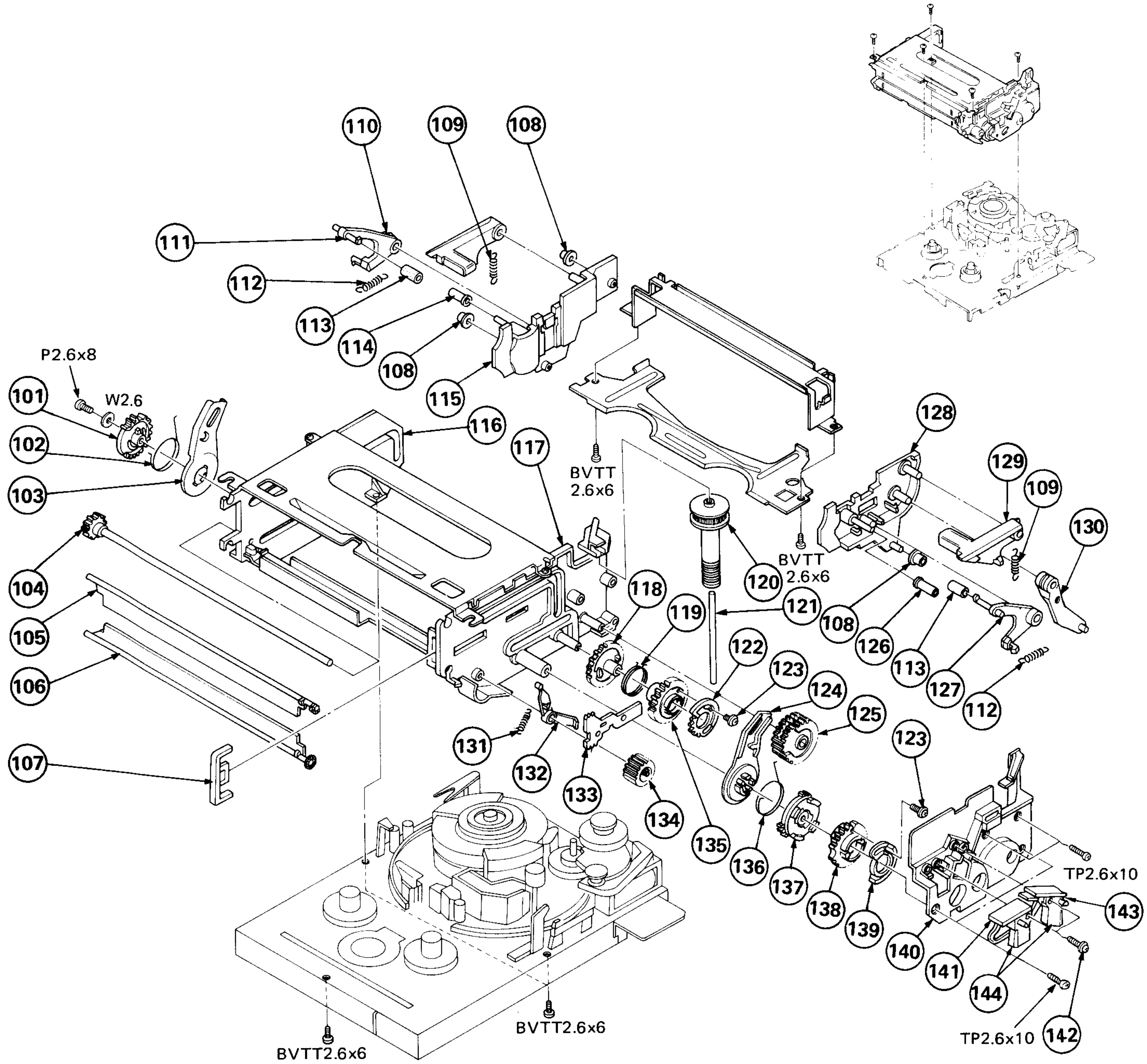
## 2. TUNER, TIMER AND POWER ASSEMBLIES


65
66
67
68
74
69
75
60
BVTT4x6
BVTT 4x6
BVTT 2.6x6
BVTT 2.6x6
BVTT2.6x6
BVTT2.6x6
BVTT2.6x6
BVTT2.6x6
63
62
BVTT 2.6x6
BVTT2.6x6
BVTT 2.6x6
64
BVTT 2.6x6
76
BVTT 2.6x6
61
79
BVTT 2.6x6
BVTT 2.6x6
BVTT 2.6x6
80
59
BVTT 2.6x6
70
58
73
72
71
56
BVTT2.6x6
78
52
55
BVTT2.6x6
BVTT 2.6x6
BVTT 2.6x6
BVTT 2.6x6
BVTT2.6x6
BVTT2.6x6
51
77
57
53
54

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

| No. | Part No. | Description | Remark |
|---|---|---|---|
| 51 | 3-681-145-02 | HOLDER, RAY CATCHER | |
| 52 | ♠:1-606-794-00 | N BOARD | |
| 53 | ♠:1-610-410-00 | SW-25 BOARD | |
| 54 | ♠:3-681-184-00 | HOLDER, PC BOARD | |
| 55 | ♠:A-6711-444-A | YC-25 BOARD, COMPLETE | |
| 56 | ♠:A-6715-187-A | SS-16 BOARD, COMPLETE | |
| 57 | ♠:A-6711-443-A | RY-1 BOARD, COMPLETE | |
| 58 | ♠:1-610-405-00 | TM-39 BOARD | |
| 59 | ♠:1-610-406-00 | FU-14 BOARD | |
| 60 | ♠:1-610-404-00 | TM-38 BOARD | |
| 61 | ♠:1-610-407-00 | CH-36 BOARD | |
| 62 | 3-681-127-00 | HOLDER, PCB | |
| 63 | ♠:1-610-403-00 | TM-37 BOARD | |
| 64 | ♠:3-681-123-00 | PLATE, SHIELD | |
| 65 | ⚠1-447-614-00 | TRANSFORMER, POWER (AEP,UK MODEL) | |
| | ⚠1-447-665-00 | TRANSFORMER, POWER (E MODEL) | |
| 66 | ♠:A-6728-737-A | PS-22 BOARD, COMPLETE | |
| 67 | ♠:1-610-409-00 | PS-23 BOARD | |
| 68 | 3-681-112-00 | SHEET, RADIATION | |
| 69 | 3-681-146-00 | COVER, PRESET | |
| 70 | ♠:A-6713-175-A | AM-3 BOARD, COMPLETE | |
| 71 | ♠:A-6721-176-A | TU-39 BOARD, COMPLETE (UK MODEL) | |
| | ♠:A-6721-168-A | TU-39 BOARD, COMPLETE (AEP,E MODEL) | |
| 72 | ⚠1-463-350-00 | TUNER (BT-881) (AEP,E MODEL) | |
| | ⚠1-463-371-00 | TUNER (BT-882) (UK MODEL) | |
| 73 | ♠:1-610-400-00 | MT-4 BOARD | |
| 74 | ♠:3-681-144-00 | BRACKET, POWER PC BOARD | |
| 75 | ♠:3-662-383-00 | BAND, RETAINER, TUNER | |
| 76 | 3-681-116-02 | HEAT SINK | |
| **77** | **♠:4-342-117-00** | **CASE, SHIELD (MAIN), R** | |
| 78 | ♠:4-342-118-00 | LID, SHIELD CASE, R | |
| 79 | ♠:3-655-214-00 | CLIP, CABLE | |
| 80 | ♠:3-644-407-00 | CLIP, AC WIRE E | |

## 3. FRONT LOADING ASSEMBLY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P2.6x8
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W2.6
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BVTT 2.6x6
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BVTT 2.6x6
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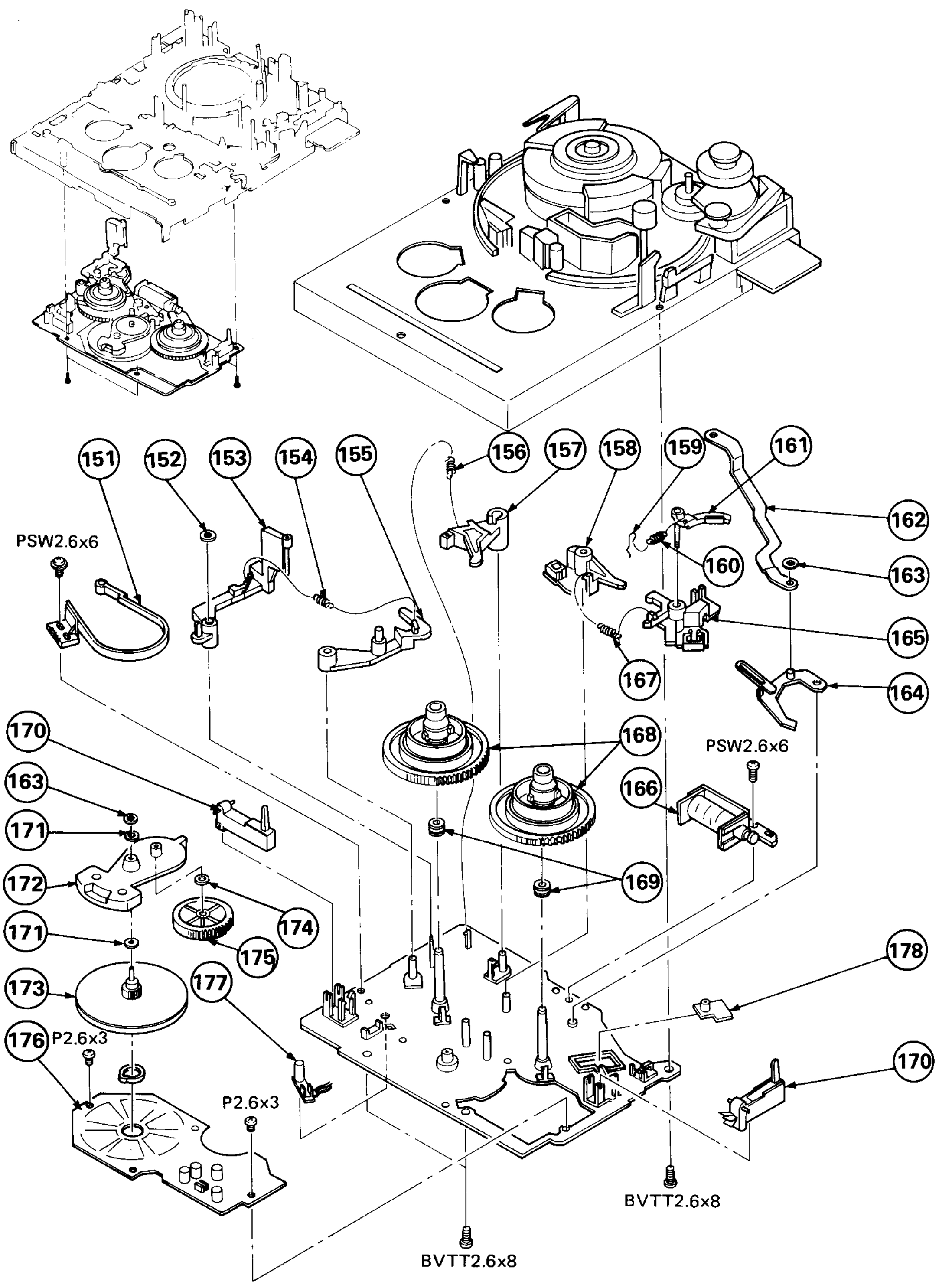
TP2.6x10
TP2.6x10
BVTT2.6x6
BVTT2.6x6

| No. | Part No. | Description | Remark |
|---|---|---|---|
| 101 | 3-679-226-02 | GEAR (LEFT), ARM, DRIVING | |
| 102 | 3-679-145-00 | SPRING (LEFT) | |
| 103 | 3-679-220-03 | ARM (LEFT), DRIVING | |
| 104 | X-3679-105-0 | SHAFT ASSY, GEAR, MIDWAY | |
| 105 | 3-679-222-02 | DOOR, UPPER | |
| 106 | 3-679-223-02 | DOOR, LOWER | |
| 107 | 3-679-137-02 | HOLDER, OUTER DOOR | |
| 108 | 3-679-143-02 | ROLLER | |
| 109 | 3-679-188-00 | SPRING, TENSION | |
| 110 | 3-679-132-02 | LEVER (LEFT), PREVENTION | |
| 111 | 3-679-130-02 | LEVER (LEFT), RETAINER, CASSETTE | |
| 112 | 3-679-288-00 | SPRING, TENSION | |
| 113 | 3-679-135-00 | RUBBER, RETAINER, CASSETTE | |
| 114 | 3-679-128-00 | ROLLER (RIGHT), DRIVING | |
| 115 | ♦:X-3679-107-2 | PLATE ASSY, SIDE, BASE LEFT | |
| 116 | ♦:3-679-266-02 | PLATE, SIDE, LEFT | |
| 117 | ♦:3-679-265-02 | PLATE, SIDE, RIGHT | |
| 118 | 3-679-217-02 | GEAR (A), LIMITER | |
| 119 | 3-679-139-00 | SPRING | |
| 120 | 3-679-215-00 | GEAR, WORM | |
| 121 | 3-679-123-00 | SHAFT, GEAR, WORM | |
| 122 | 3-679-124-02 | CAM (CASSETTE OFF) | |
| 123 | 3-669-480-21 | + PTPWH 2 | |
| 124 | 3-679-219-02 | ARM (RIGHT), DRIVING | |
| 125 | 3-679-216-02 | WHEEL, WORM | |
| 126 | 3-679-316-00 | ROLLER (LEFT), DRIVING | |
| 127 | 3-679-129-02 | LEVER(RIGHT), RETAINER, CASSETTE | |
| 128 | ♦:X-3679-106-2 | PLATE ASSY, SIDE, BASE RIGHT | |
| 129 | 3-679-131-02 | LEVER (RIGHT), PREVENTION | |
| 130 | 3-679-133-02 | ARM, LID OPEN | |
| 131 | 3-679-189-00 | SPRING, TENSION | |
| 132 | 3-679-134-02 | ARM, SWITCHING, DOOR | |
| 133 | 3-679-221-02 | PLATE, RACK, SWITCHING, DOOR | |
| 134 | 3-679-126-02 | GEAR (RIGHT), MIDWAY | |
| 135 | 3-679-218-02 | GEAR (B), LIMITER | |
| 136 | 3-679-144-00 | SPRING (RIGHT) | |
| 137 | 3-679-225-02 | GEAR (RIGHT), ARM, DRIVING | |
| 138 | 3-679-125-02 | GEAR, DRIVING | |
| 139 | 3-679-138-02 | CAM (CASSETTE ON) | |
| 140 | ♦:3-679-214-02 | HOLDER, GEAR, WORM | |
| 141 | ♦:1-609-227-00 | CS-3 BOARD | |
| 142 | 3-669-480-00 | + PTPWH 2 | |
| 143 | ♦:1-609-228-00 | CS-4 BOARD | |
| **144** | **1-554-241-00** | **SWITCH, LEVER** | |

## 4. REEL TABLE ASSEMBLY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PSW2.6x6
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P2.6x3
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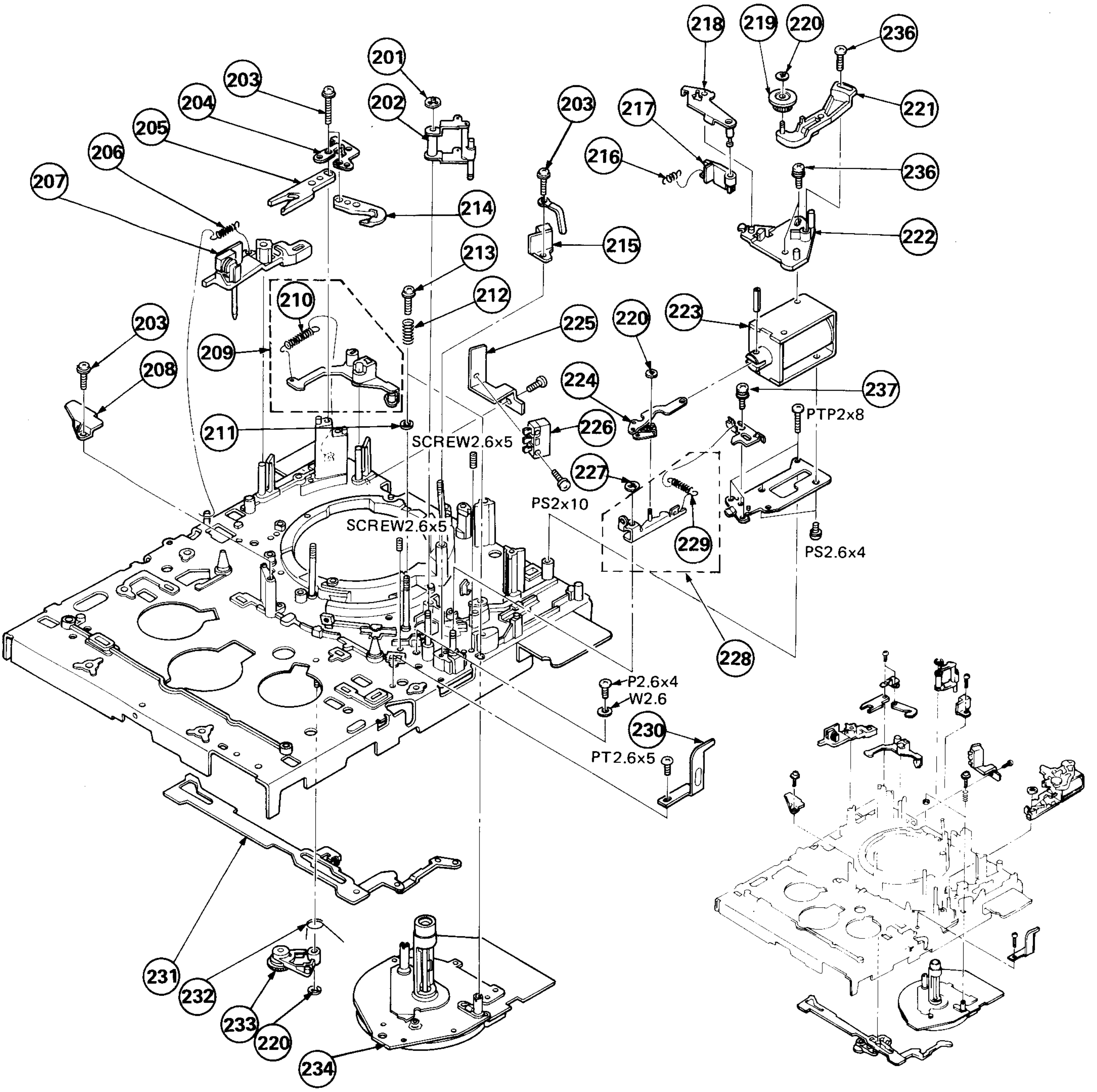
P2.6x3
BVTT2.6x8
BVTT2.6x8

| No. | Part No. | Description | Remark |
|---|---|---|---|
| 151 | X-3679-120-0 | BAND ASSY, TENSION REGULATOR | |
| 152 | 3-669-465-00 | WASHER (1.5), STOPPER | |
| 153 | X-3679-122-0 | LEVER ASSY, TENSION REGULATOR | |
| 154 | 3-679-156-00 | SPRING, TENSION | |
| 155 | ♠:3-679-230-00 | LEVER, FUNCTION | |
| 156 | 3-679-151-00 | SPRING, TENSION | |
| 157 | ♠:3-679-231-00 | LEVER, BRAKE, SOFT | |
| 158 | X-3679-117-3 | BRAKE ASSY, S | |
| 159 | ♠:3-681-163-00 | HOOK, SPRING, REWIND | |
| 160 | 3-681-156-00 | SPRING, TENSION | |
| 161 | ♠:X-3681-105-0 | ARM ASSY, REWIND BRAKE | |
| 162 | ♠:3-679-168-03 | JOINT, BRAKE, L | |
| 163 | 3-669-595-00 | WASHER (2), STOPPER | |
| 164 | X-3679-119-4 | ARM ASSY, STOPPER, PENDULUM | |
| 165 | X-3679-118-3 | BRAKE ASSY, T | |
| 166 | 1-454-348-31 | SOLENOID, BRAKE PLUNGER | |
| 167 | 3-679-190-02 | SPRING, TENSION | |
| 168 | X-3681-104-0 | TABLE ASSY, S REEL | |
| 169 | 3-646-185-00 | BEARING | |
| 170 | 1-554-374-00 | SWITCH, LEVER | |
| 171 | 3-679-318-00 | WASHER, PENDULUM ARM | |
| 172 | X-3679-114-3 | ARM ASSY, PENDULUM | |
| 173 | X-2622-201-2 | ROTOR ASSY, R | |
| 174 | 3-679-305-05 | WASHER, FRICTION | |
| 175 | X-3679-113-4 | GEAR ASSY, PENDULUM | |
| 176 | ♠:A-4910-021-A | R STATOR BOARD, COMPLETE | |
| 177 | ♠:1-610-401-00 | RD-6 BOARD | |
| 178 | ♠:1-610-402-00 | RD-7 BOARD | |

## 5. CHASSIS ASSEMBLY (1)



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PTP2x8
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SCREW2.6x5
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PS2x10
229
SCREW2.6x5
PS2.6x4
228
P2.6x4
W2.6
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PT2.6x5
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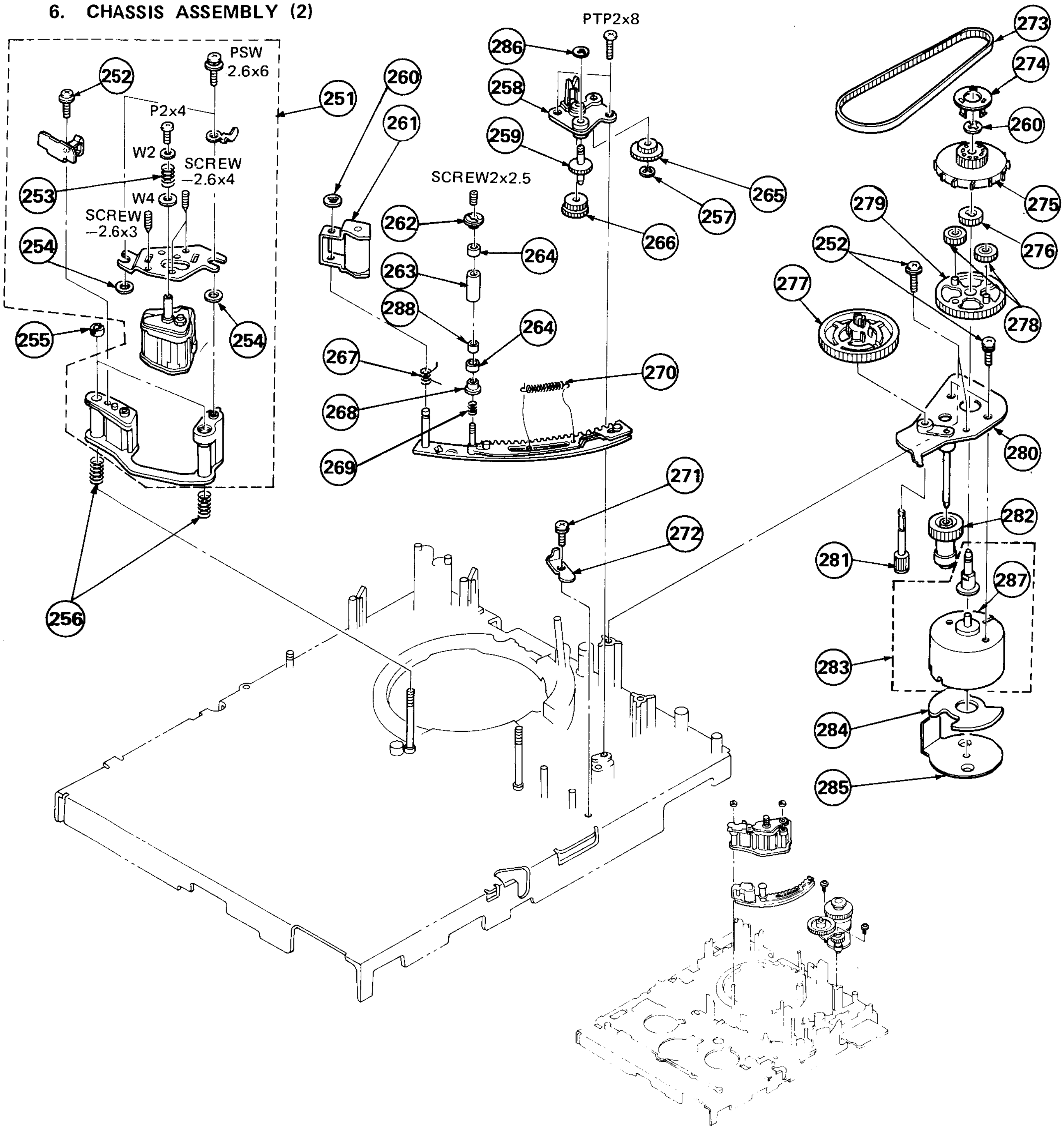
| No. | Part No. | Description | Remark |
|---|---|---|---|
| 201 | 3-669-596-00 | WASHER (2.3), STOPPER | |
| 202 | ♠:X-3679-108-0 | ARM ASSY, PRESS, PINCH | |
| 203 | 3-669-480-11 | + PTPWH 2 | |
| 204 | ♠:3-672-540-00 | PLATE, GROUND, TAPE GUIDE | |
| 205 | ♠:3-669-618-00 | PLATE (2), ADJUST | |
| 206 | 3-679-164-00 | SPRING, TENSION | |
| 207 | 1-464-249-21 | SENSOR, S COIL | |
| 208 | ♠:3-669-476-04 | PLATE, GUIDE | |
| 209 | X-3679-149-0 | ARM (B) ASSY, LOCK | 210 |
| 210 | 3-679-323-00 | SPRING, TENSION | |
| 211 | 3-669-697-00 | SPACER, CAPSTAN | |
| 212 | 3-679-359-00 | SPRING, COMPRESSION | |
| 213 | 3-669-633-00 | SCREW, + PW2 | |
| 214 | ♠:3-672-507-00 | PLATE (3-1), ADJUSTMENT | |
| 215 | 1-464-250-00 | SENSOR, T COIL | |
| 216 | 3-508-108-XX | SPRING, TENSION | |
| 217 | ♠:3-679-251-00 | LIMITER, STOPPER | |
| 218 | ♠:X-3679-123-0 | ARM ASSY, STOPPER | |
| 219 | 3-679-307-00 | GEAR, TENSION | |
| 220 | 3-669-465-00 | WASHER (1.5), STOPPER | |
| 221 | ♠:X-3679-145-0 | ARM ASSY, CAR, TENSION | |
| 222 | ♠:3-679-117-05 | CHASSIS, ARM, STOPPER | |
| 223 | 1-454-349-00 | SOLENOID, PLUNGER | |
| 224 | X-3679-152-0 | ARM (B) ASSY, PINCH SOLENOID | |
| 225 | ♠:3-672-542-00 | BRACKET, SWITCH, LE | |
| 226 | 1-553-539-00 | SWITCH, MICRO | |
| 227 | 3-669-595-00 | WASHER (2), STOPPER | |
| 228 | ♠:X-3669-379-0 | ARM (P) ASSY, PINCH LIMITER | 229 |
| 229 | 3-465-159-XX | SPRING, TENSION | |
| 230 | ♠:3-679-163-00 | PLATE, LID OPEN | |
| 231 | X-3681-106-0 | LEVER ASSY, SLIDE | |
| 232 | 3-681-154-00 | SPRING, TORSION | |
| 233 | X-3681-107-0 | ARM ASSY, REVIEW BRAKE | |
| 234 | 8-838-048-00 | MOTOR, DC (BHF-1908A) | |
| 236 | 3-669-607-00 | +PSW (SMALL ROUND) 2.6 | |
| 237 | 3-669-607-31 | +PSW (SMALL ROUND) (2.6) | |

## 6. CHASSIS ASSEMBLY (2)


PSW 2.6x6
P2x4
W2
SCREW −2.6x4
W4
SCREW −2.6x3
PTP2x8
SCREW2x2.5
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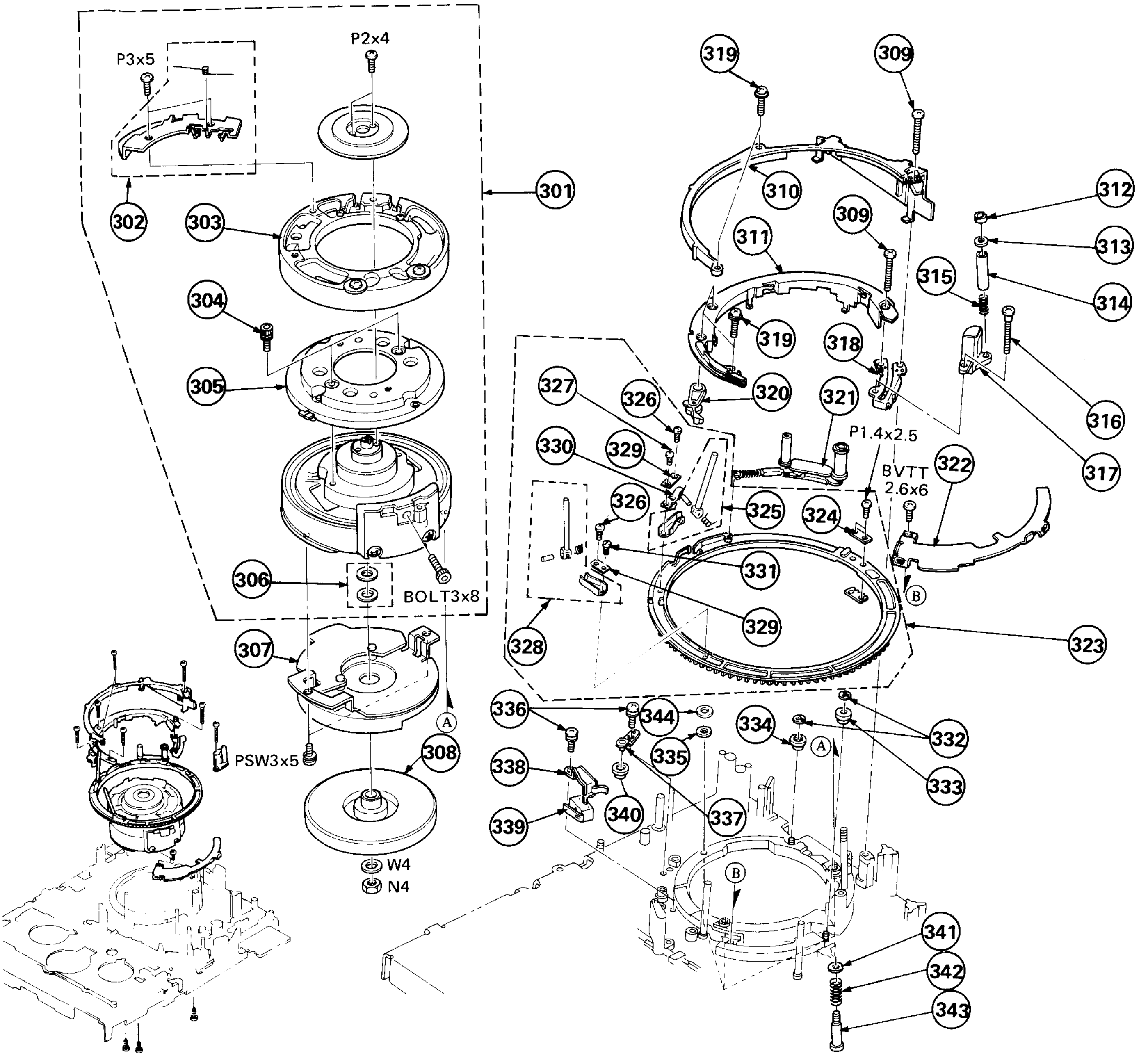
| No. | Part No. | Description | Remark |
|---|---|---|---|
| 251 | A-6761-060-A | ACE ASSY | 252,253,254 |
| 252 | 3-669-480-11 | + PTPWH 2 | |
| 253 | ♠:3-669-316-00 | SPRING, COMPRESSION | |
| 254 | 3-669-598-00 | WASHER, CTL | |
| 255 | 3-669-318-00 | NUT, ADJUSTMENT, GUIDE | |
| 256 | 3-669-317-00 | SPRING, COMPRESSION | |
| 257 | 3-669-465-00 | WASHER (1.5), STOPPER | |
| 258 | X-3679-147-0 | CHASSIS (B) ASSY, DRIVE GEAR | |
| 259 | X-3679-148-0 | GEAR (F) ASSY (B) | |
| 260 | 3-669-596-00 | WASHER (2.3), STOPPER | |
| 261 | X-3669-307-6 | ARM ASSY, PINCH ROLLER | |
| 262 | 3-669-431-00 | FLANGE (UPPER), GUIDE | |
| 263 | 3-669-438-00 | ROLLER, GUIDE | |
| 264 | 3-669-443-00 | BEARING, BALL (NO FLANGE) | |
| 265 | 3-669-337-00 | GEAR (D) | |
| 266 | 3-669-338-00 | GEAR (E) | |
| 267 | 3-669-444-00 | SPRING, TORSION | |
| 268 | 3-669-432-00 | FLANGE (LOWER), GUIDE | |
| 269 | 3-669-452-00 | SPRING, COMPRESSION | |
| 270 | 3-549-014-00 | SPRING, TENSION | |
| 271 | 3-669-607-31 | +PSW (SMALL ROUND) (2.6) | |
| 272 | ♠:3-679-165-00 | STOPPER, SLIDER | |
| 273 | 3-679-119-00 | BELT, SYNCHRO | |
| 274 | 3-679-140-00 | FLANGE, GEAR, INTERNAL | |
| 275 | 3-679-101-03 | GEAR, INTERNAL | |
| 276 | 3-679-104-00 | GEAR | |
| 277 | 3-679-115-00 | GEAR (LARGE), LOADING | |
| 278 | X-3679-124-2 | GEAR ASSY, PLANET | |
| 279 | X-3679-111-0 | CARRIER ASSY | |
| 280 | ♠:X-3679-112-0 | CHASSIS ASSY, GEAR, PLANET | |
| 281 | 3-679-114-00 | GEAR (SMALL), LOADING | |
| 282 | X-3669-321-0 | GEAR (C) ASSY | |
| 283 | A-6737-118-A | MOTOR ASSY, L | 287 |
| 284 | ♠:1-605-071-21 | LM-8 BOARD | |
| 285 | ♠:3-669-613-00 | INSULATOR, L MOTOR | |
| 286 | 3-669-595-00 | WASHER (2), STOPPER | |
| 287 | 1-541-163-31 | MOTOR | |
| 288 | 3-657-841-31 | SPACER (2X2.5) | |

## 7. DRUM AND S LOADING ASSEMBLIES


P3x5
P2x4
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302
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BOLT3x8
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PSW3x5
W4
N4
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P1.4x2.5
BVTT
2.6x6
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| No. | Part No. | Description | Remark |
|---|---|---|---|
| 301 | A-6050-187-A | DRUM ASSY (DSH-35A-R) | 302,303,304,305,306 |
| 302 | A-6760-066-B | SPRING ASSY, TAPE RETAINER | |
| 303 | A-6760-119-A | DRUM ASSY, UPPER | |
| 304 | 3-669-157-00 | BOLT (WASHER) (2.6X8) | |
| 305 | A-6762-124-A | DISK ASSY | |
| 306 | **X-2621-204-2** | SPACER BLOCK ASSY | |
| 307 | X-2621-204-02 | STATOR ASSY, D | |
| 308 | X-2621-202-0 | ROTOR ASSY, D | |
| 309 | 3-669-466-00 | SCREW (M 2.6) | |
| 310 | ♠:3-669-585-00 | GUIDE (2), SHUTTLE | |
| 311 | ♠:3-669-584-00 | GUIDE (1), SHUTTLE | |
| 312 | 3-669-446-00 | NUT, GUIDE, NO. 6 | |
| 313 | 3-669-447-00 | FLANGE, GUIDE, NO. 6 | |
| 314 | 3-669-445-00 | SPACER, GUIDE, NO. 6 | |
| 315 | 3-669-615-00 | SPRING, COMPRESSION | |
| 316 | 3-669-606-00 | SCREW (2.6) | |
| 317 | 8-825-508-10 | HEAD, FE | |
| 318 | ♠:X-3669-313-0 | BASE ASSY, SLANT | |
| 319 | 3-669-480-11 | + PTPWH 2 | |
| **320** | X-3669-327-0 | ARM ASSY, SWITCH, ULE | |
| **321** | A-6750-108-B | SHUTTLE BLOCK ASSY, THREADING | |
| 322 | ♠:3-669-477-00 | LINER, LINK, PIN | |
| 323 | X-3679-150-0 | RING (YA) ASSY, S LOADING | 324,325,326<br>327,328,329,330,331 |
| 324 | ♠:3-669-616-00 | RETAINER | |
| 325 | ♠:X-3669-430-2 | HOLDER BLOCK ASSY, #3 GUIDE | |
| 326 | 3-669-478-00 | SCREW (1X3), TAPPING | |
| 327 | 3-669-479-11 | SCREW (1.4X3.5), TAPPING | |
| 328 | ♠:X-3669-429-0 | HOLDER BLOCK ASSY, #2 GUIDE | |
| 329 | ♠:3-669-472-02 | RETAINER, SPRING, LEAF | |
| 330 | 3-672-583-00 | SPRING | |
| 331 | 3-672-586-00 | SCREW (1.4X3), TAPPING | |
| 332 | 3-669-465-00 | WASHER (1.5), STOPPER | |
| 333 | 3-669-597-00 | ROLLER (B), RING | |
| 334 | 3-669-630-00 | ROLLER (C), RING | |
| 335 | ♠:3-669-646-11 | SPACER, DRUM | |
| 336 | 3-669-607-31 | +PSW (SMALL ROUND) (2.6) | |
| 337 | ♠:X-3669-329-0 | PLATE ASSY, ADJUSTMENT | |
| 338 | ♠:3-669-355-00 | HOLDER, SWITCH, ULE | |
| 339 | 1-553-718-00 | SWITCH, MICRO | |
| 340 | 3-669-360-00 | ROLLER, RING | |
| 341 | 3-669-600-11 | WASHER, FLAT (3.5) | |
| 342 | 3-429-123-00 | SPRING | |
| 343 | 3-669-302-00 | SCREW, FITTING | |
| 344 | ♠:3-669-646-00 | SPACER, DRUM | |

## 8. HARDWARE LIST

### SCREW

| | |
|---|---|
| 7-621-255-25 | SCREW +P 2X4 |
| 7-621-259-32 | SCREW +P 2.6X5 |
| 7-621-259-35 | SCREW +P 2.6X5 |
| 7-628-253-45 | SCREW +PS 2X10 |
| 7-628-253-95 | SCREW +PS 2.6X4 |
| 7-628-254-15 | SCREW +PS 2.6X6 |
| 7-685-134-11 | SCREW +P 2.6X8 TYPE2 NON-SLIT |
| 7-685-135-11 | SCREW +P 2.6X10 TYPE2 NON-SLIT |
| 7-685-534-19 | SCREW +BTP 2.6X8 TYPE2 N-S |
| 7-685-791-01 | SCREW +PTT 2.6X5 (S) |
| 7-685-861-09 | SCREW +BVTT 2.6X5 (S) |
| 7-685-862-01 | SCREW +BVTT 2.6X6 (S) |
| 7-685-863-01 | SCREW +BVTT 2.6X8 (S) |
| 7-685-880-01 | SCREW +BVTT 4X6 (S) |
| 7-627-551-08 | SCREW, PRECISION +P 1.4X1.6 |
| 7-627-551-28 | SCREW, PRECISION +P 1.4X2.5 |
| 7-621-759-35 | +PSW, 2.6X5 |
| 7-621-759-45 | +PSW, 2.6X6 |

### SET-SCREW

| | |
|---|---|
| 7-621-712-26 | SET-SCREW, SLOT 2.6X3FLAT POINT |
| 7-621-712-35 | SET-SCREW, SLOT 2.6X4CONE POINT |
| 7-621-712-46 | SET-SCREW, SLOT 2.6X5FLAT POINT |

### TAPPING SCREW

| | |
|---|---|
| 7-685-105-11 | TPG +P 2X8, TYPE 2, NON-SLIT |

### SPRING PIN

| | |
|---|---|
| 7-626-302-31 | SPRING PIN, 2.5X14 |

### NUT

| | |
|---|---|
| 7-622-205-05 | N 2, TYPE 2 |

### WASHER

| | |
|---|---|
| 7-688-001-11 | W 2, MIDDLE |
| 7-688-002-11 | W 2.6, MIDDLE |
| 7-688-004-01 | W 4, SMALL |

# SECTION 5
# ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- =>: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.
- Items marked " ♠ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
- MF : µF, PF : µµF

RESISTORS
- All resistors are in ohms
- F : nonflammable

COILS
- MMH : mH, UH : µH

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| | ♠:A-4910-021-A | R STATOR BOARD, COMPLETE<br>************************ | | | (REEL MOTOR BOARD) |
| | ♠:1-560-460-00 | PIN, CONNECTOR 4P | | | |
| | | CAPACITOR | | | |
| C1 | 1-123-821-41 | ELECT | 47MF | 20% | 16V |
| C2 | 1-123-821-41 | ELECT | 47MF | 20% | 16V |
| C3 | 1-123-821-41 | ELECT | 47MF | 20% | 16V |
| C4 | 1-123-821-41 | ELECT | 47MF | 20% | 16V |
| | | DIODE | | | |
| D1 | 8-719-941-48 | DIODE 1N4148TP | | | |
| | | IC | | | |
| IC1 | 8-759-108-77 | IC CX-877 | | | |
| | | TRANSISTOR | | | |
| Q1 | 8-729-100-01 | TRANSISTOR 2SD992 | | | |
| Q2 | 8-729-100-01 | TRANSISTOR 2SD992 | | | |
| Q3 | 8-729-100-01 | TRANSISTOR 2SD992 | | | |
| Q4 | 8-729-100-01 | TRANSISTOR 2SD992 | | | |
| Q5 | 8-729-100-01 | TRANSISTOR 2SD992 | | | |
| Q6 | 8-729-100-01 | TRANSISTOR 2SD992 | | | |
| | | RESISTOR | | | |
| R1 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W |
| R2 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W |
| R3 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W |
| R4 | 1-247-829-00 | CARBON | 820 | 5% | 1/6W |
| R5 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W |
| R6 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W |
| R7 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W |
| R8 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W |
| | | DIODE | | | |
| S1 | 8-719-810-31 | DIODE THS103-1 | | | |
| S2 | 8-719-810-31 | DIODE THS103-1 | | | |
| ************************************************************** | | | | | |
| | ♠:A-6711-443-A | RY-1 BOARD, COMPLETE<br>******************** | | | |
| | ♠:3-681-177-00 | CASE (MAIN), SHIELD, RY | | | |
| | ♠:3-681-178-00 | LID, UPPER, SHIELD CASE, RY | | | |
| | ♠:3-681-179-00 | LID, BOTTOM, SHIELD CASE, RY | | | |
| | | CAPACITOR | | | |
| C001 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C002 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C003 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C004 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C005 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C006 | 1-123-305-00 | ELECT | 33MF | 20% | 10V |
| C007 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C008 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C009 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C010 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C011 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C012 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C013 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C014 | 1-161-019-00 | CERAMIC | 0.033MF | 10% | 25V |
| C015 | 1-102-973-00 | CERAMIC | 100PF | 5% | 50V |
| C016 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C017 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C018 | 1-123-381-00 | ELECT | 2.2MF | 20% | 50V |
| C019 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C020 | 1-161-017-00 | CERAMIC | 0.022MF | 10% | 25V |
| C021 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C022 | 1-102-951-00 | CERAMIC | 15PF | 5% | 50V |
| C023 | 1-102-951-00 | CERAMIC | 15PF | 5% | 50V |
| C024 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C026 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C027 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C028 | 1-161-017-00 | CERAMIC | 0.022MF | 10% | 25V |
| C029 | 1-161-017-00 | CERAMIC | 0.022MF | 10% | 25V |
| C030 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C031 | 1-161-025-00 | CERAMIC | 0.1MF | 10% | 25V |
| C032 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C035 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C036 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C037 | 1-102-851-00 | CERAMIC | 15PF | 5% | 50V |
| C038 | 1-161-025-00 | CERAMIC | 0.1MF | 10% | 25V |
| C039 | 1-102-981-00 | CERAMIC | 300PF | 5% | 50V |
| C040 | 1-102-981-00 | CERAMIC | 300PF | 5% | 50V |
| C041 | 1-102-976-00 | CERAMIC | 180PF | 5% | 50V |
| C044 | 1-102-515-00 | CERAMIC | 24PF | 5% | 50V |
| C045 | 1-161-025-00 | CERAMIC | 0.1MF | 10% | 25V |
| C046 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C047 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C048 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C049 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C051 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C052 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C053 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C054 | 1-102-112-00 | CERAMIC | 330PF | 10% | 50V |
| C055 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C056 | 1-102-112-00 | CERAMIC | 330PF | 10% | 50V |
| C057 | 1-102-948-00 | CERAMIC | 11PF | 5% | 50V |
| C058 | 1-102-112-00 | CERAMIC | 330PF | 10% | 50V |
| C059 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C060 | 1-102-119-00 | CERAMIC | 0.0015MF | 10% | 50V |
| C061 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C062 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C063 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C065 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |

# RY-1

| Ref.No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| C066 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C067 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C068 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C069 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C070 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C071 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C073 | 1-102-511-00 | CERAMIC | 13PF | 5% | 50V |
| C074 | 1-102-522-00 | CERAMIC | 51PF | 5% | 50V |
| C075 | 1-102-522-00 | CERAMIC | 51PF | 5% | 50V |
| C076 | 1-102-511-00 | CERAMIC | 13PF | 5% | 50V |
| C077 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C078 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C079 | 1-123-307-00 | ELECT | 100MF | 20% | 10V |
| C080 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C083 | 1-123-296-00 | ELECT | 220MF | 20% | 6.3V |
| C084 | 1-123-296-00 | ELECT | 220MF | 20% | 6.3V |
| C085 | 1-102-511-00 | CERAMIC | 13PF | 5% | 50V |
| C086 | 1-102-522-00 | CERAMIC | 51PF | 5% | 50V |
| C087 | 1-102-522-00 | CERAMIC | 51PF | 5% | 50V |
| C088 | 1-102-511-00 | CERAMIC | 13PF | 5% | 50V |
| C092 | 1-102-529-00 | CERAMIC | 100PF | 5% | 50V |
| C093 | 1-123-332-00 | ELECT | 47MF | 20% | 16V |
| C094 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C096 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C097 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C098 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C099 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C100 | 1-102-519-00 | CERAMIC | 36PF | 5% | 50V |
| C101 | 1-102-529-00 | CERAMIC | 100PF | 5% | 50V |
| C103 | 1-102-508-00 | CERAMIC | 10PF | 0.5PF | 50V |
| C105 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C106 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C107 | 1-102-976-00 | CERAMIC | 180PF | 5% | 50V |
| C108 | 1-102-823-00 | CERAMIC | 430PF | 5% | 50V |
| C109 | 1-102-821-00 | CERAMIC | 360PF | 5% | 50V |
| C111 | 1-102-851-00 | CERAMIC | 15PF | 5% | 50V |
| C113 | 1-101-059-00 | CERAMIC | 510PF | 5% | 50V |
| C115 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C117 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C118 | 1-102-958-00 | CERAMIC | 20PF | 5% | 50V |
| C119 | 1-102-958-00 | CERAMIC | 20PF | 5% | 50V |
| C122 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C123 | 1-102-513-00 | CERAMIC | 18PF | 5% | 50V |
| C124 | 1-102-958-00 | CERAMIC | 20PF | 5% | 50V |
| C125 | 1-102-958-00 | CERAMIC | 20PF | 5% | 50V |
| C126 | 1-102-114-00 | CERAMIC | 470PF | 10% | 50V |
| | | CONNECTOR | | | |
| CN001●: | 1-508-848-00 | PIN, CONNECTOR 6P | | | |
| CN002●: | 1-564-030-00 | PIN, CONNECTOR 5P | | | |
| CN003●: | 1-564-028-00 | PIN, CONNECTOR 3P | | | |

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| | | DIODE | |
| D001 | 8-719-911-19 | DIODE 1SS119 | |
| D002 | 8-719-911-19 | DIODE 1SS119 | |
| D003 | 8-719-911-19 | DIODE 1SS119 | |
| D004 | 8-719-911-19 | DIODE 1SS119 | |
| D005 | 8-719-000-12 | DIODE MC931 | |
| D007 | 8-719-911-19 | DIODE 1SS119 | |
| D008 | 8-719-911-19 | DIODE 1SS119 | |
| D010 | 8-719-911-19 | DIODE 1SS119 | |
| D011 | 8-719-911-19 | DIODE 1SS119 | |
| D012 | 8-719-100-69 | DIODE RD13EB3 | |
| | | DELAY LINE | |
| DL001 | 1-415-312-00 | DELAY LINE (1H) | |
| | | IC | |
| IC001 | 8-758-620-00 | IC CX-862 | |
| IC002 | 8-751-340-00 | IC CX-134A | |
| IC003 | 8-759-608-64 | IC CX-864 | |
| IC004 | 8-751-350-00 | IC CX-135 | |
| | | COIL | |
| L001 | 1-408-429-00 | MICRO INDUCTOR 470UH | |
| L002 | 1-408-878-21 | MICRO INDUCTOR 0.33UH | |
| L003 | 1-408-878-21 | MICRO INDUCTOR 0.33UH | |
| L004 | 1-408-421-00 | MICRO INDUCTOR 100UH | |
| L005 | 1-408-425-00 | MICRO INDUCTOR 220UH | |
| L006 | 1-408-425-00 | MICRO INDUCTOR 220UH | |
| L007 | 1-407-502-00 | MICRO INDUCTOR 6.8MMH | |
| L008 | 1-407-502-00 | MICRO INDUCTOR 6.8MMH | |
| L009 | 1-408-414-00 | MICRO INDUCTOR 27UH | |
| L010 | 1-408-414-00 | MICRO INDUCTOR 27UH | |
| L012 | 1-407-717-00 | MICRO INDUCTOR 1MMH | |
| L014 | 1-408-410-00 | MICRO INDUCTOR 12UH | |
| L015 | 1-408-423-00 | MICRO INDUCTOR 150UH | |
| L017 | 1-408-423-00 | MICRO INDUCTOR 150UH | |
| L018 | 1-408-415-00 | MICRO INDUCTOR 33UH | |
| L019 | 1-408-421-00 | MICRO INDUCTOR 100UH | |
| L020 | 1-408-412-00 | MICRO INDUCTOR 18UH | |
| L021 | 1-408-412-00 | MICRO INDUCTOR 18UH | |
| L022 | 1-408-422-00 | MICRO INDUCTOR 120UH | |
| L023 | 1-408-424-00 | MICRO INDUCTOR 180UH | |
| L024 | 1-408-422-00 | MICRO INDUCTOR 120UH | |
| L025 | 1-408-422-00 | MICRO INDUCTOR 120UH | |
| L026 | 1-408-424-00 | MICRO INDUCTOR 180UH | |
| L027 | 1-408-422-00 | MICRO INDUCTOR 120UH | |
| L028 | 1-408-423-00 | MICRO INDUCTOR 150UH | |
| L029 | 1-408-416-00 | MICRO INDUCTOR 39UH | |
| L030 | 1-408-416-00 | MICRO INDUCTOR 39UH | |
| L031 | 1-408-421-00 | MICRO INDUCTOR 100UH | |
| L032 | 1-408-411-00 | MICRO INDUCTOR 15UH | |
| L033 | 1-408-423-00 | MICRO INDUCTOR 150UH | |

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| L034 | 1-408-417-00 | MICRO INDUCTOR 47UH | | | | |
| L035 | 1-408-416-00 | MICRO INDUCTOR 39UH | | | | |
| L036 | 1-407-170-XX | MICRO INDUCTOR 120UH | | | | |

### TRANSISTOR

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| Q001 | =>8-729-245-83 | TRANSISTOR 2SC2458 | | | | |
| Q002 | 8-729-117-54 | TRANSISTOR 2SA1175 | | | | |
| Q003 | =>8-729-245-83 | TRANSISTOR 2SC2458 | | | | |
| Q004 | =>8-729-245-83 | TRANSISTOR 2SC2458 | | | | |
| Q005 | =>8-729-245-83 | TRANSISTOR 2SC2458 | | | | |
| Q006 | =>8-729-245-83 | TRANSISTOR 2SC2458 | | | | |
| Q008 | 8-729-384-48 | TRANSISTOR 2SA844 | | | | |
| Q009 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q010 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q011 | 8-729-384-48 | TRANSISTOR 2SA844 | | | | |
| Q012 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q013 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q014 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q015 | 8-729-384-48 | TRANSISTOR 2SA844 | | | | |
| Q016 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q017 | 8-729-384-48 | TRANSISTOR 2SA844 | | | | |
| Q018 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q019 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q021 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q022 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q023 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q024 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q025 | 8-729-384-48 | TRANSISTOR 2SA844 | | | | |
| Q028 | 8-729-384-48 | TRANSISTOR 2SA844 | | | | |
| Q029 | 8-729-384-48 | TRANSISTOR 2SA844 | | | | |
| Q033 | 8-729-384-48 | TRANSISTOR 2SA844 | | | | |
| Q034 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q035 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q036 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |
| Q037 | 8-729-603-50 | TRANSISTOR 2SC403SP | | | | |

### RESISTOR

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R001 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R002 | 1-247-783-00 | CARBON | 10 | 5% | 1/6W | |
| R003 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R004 | 1-247-783-00 | CARBON | 10 | 5% | 1/6W | |
| R005 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R006 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R007 | 1-247-852-00 | CARBON | 7.5K | 5% | 1/6W | |
| R008 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R009 | 1-247-844-00 | CARBON | 3.6K | 5% | 1/6W | |
| R010 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R011 | 1-247-807-00 | CARBON | 100 | 5% | 1/6W | |
| R012 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R013 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R014 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R015 | 1-247-827-00 | CARBON | 680 | 5% | 1/6W | |
| R016 | 1-247-827-00 | CARBON | 680 | 5% | 1/6W | |

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R017 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R018 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R019 | 1-247-844-00 | CARBON | 3.6K | 5% | 1/6W | |
| R020 | 1-247-844-00 | CARBON | 3.6K | 5% | 1/6W | |
| R021 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R022 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R023 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R024 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R025 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R026 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R027 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R028 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R029 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R030 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R031 | 1-247-779-00 | CARBON | 6.8 | 5% | 1/6W | |
| R032 | 1-247-822-00 | CARBON | 430 | 5% | 1/6W | |
| R033 | 1-247-815-00 | CARBON | 220 | 5% | 1/6W | |
| R034 ⚠ | 1-212-855-00 | FUSIBLE | 8.2 | 5% | 1/4W | F |
| R035 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R036 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R037 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R038 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R039 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R040 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R041 | 1-247-833-00 | CARBON | 1.2K | 5% | 1/6W | |
| R042 ⚠ | 1-212-855-00 | FUSIBLE | 8.2 | 5% | 1/4W | F |
| R043 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R044 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R045 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R046 | 1-247-809-00 | CARBON | 120 | 5% | 1/6W | |
| R047 | 1-247-844-00 | CARBON | 3.6K | 5% | 1/6W | |
| R048 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R049 | 1-247-814-00 | CARBON | 200 | 5% | 1/6W | |
| R050 | 1-247-840-00 | CARBON | 2.4K | 5% | 1/6W | |
| R051 | 1-247-818-00 | CARBON | 300 | 5% | 1/6W | |
| R052 | 1-247-834-00 | CARBON | 1.3K | 5% | 1/6W | |
| R053 | 1-247-830-00 | CARBON | 910 | 5% | 1/6W | |
| R054 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R055 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R056 | 1-247-836-00 | CARBON | 1.6K | 5% | 1/6W | |
| R057 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R058 | 1-247-832-00 | CARBON | 1.1K | 5% | 1/6W | |
| R059 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R060 | 1-247-814-00 | CARBON | 200 | 5% | 1/6W | |
| R061 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R062 | 1-247-810-00 | CARBON | 130 | 5% | 1/6W | |
| R063 | 1-247-825-00 | CARBON | 560 | 5% | 1/6W | |
| R064 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R065 | 1-247-842-00 | CARBON | 3K | 5% | 1/6W | |
| R066 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R067 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R068 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R069 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R071 | 1-247-812-00 | CARBON | 160 | 5% | 1/6W | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

## RY-1 YC-25

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R072 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R073 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R074 | 1-247-832-00 | CARBON | 1.1K | 5% | 1/6W | |
| R075 | 1-247-832-00 | CARBON | 1.1K | 5% | 1/6W | |
| R077 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R078 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R079 | 1-247-842-00 | CARBON | 3K | 5% | 1/6W | |
| R080 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R081 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R082 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R086 | 1-247-811-00 | CARBON | 150 | 5% | 1/6W | |
| R087 | 1-247-866-00 | CARBON | 30K | 5% | 1/6W | |
| R088 | 1-247-844-00 | CARBON | 3.6K | 5% | 1/6W | |
| R089 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R090 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R091 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R092 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R093 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R095 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R096 | 1-247-807-00 | CARBON | 100 | 5% | 1/6W | |
| R099 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R100 | 1-247-817-00 | CARBON | 270 | 5% | 1/6W | |
| R101 | 1-247-817-00 | CARBON | 270 | 5% | 1/6W | |
| R102 | 1-247-861-00 | CARBON | 18K | 5% | 1/6W | |
| R103 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R104 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R105 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R106 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R108 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R109 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R110 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R111 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R112 | 1-247-827-00 | CARBON | 680 | 5% | 1/6W | |
| R113 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R115 | 1-247-833-00 | CARBON | 1.2K | 5% | 1/6W | |
| R116 | 1-247-826-00 | CARBON | 620 | 5% | 1/6W | |
| R117 | 1-247-826-00 | CARBON | 620 | 5% | 1/6W | |
| R118 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R119 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R122 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W | |
| R123 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R126 | 1-247-845-00 | CARBON | 3.9K | 5% | 1/6W | |
| R134 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R135 | 1-247-866-00 | CARBON | 30K | 5% | 1/6W | |
| R136 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R137 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R138 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R139 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R140 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R141 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R150 | 1-247-874-00 | CARBON | 62K | 5% | 1/6W | |
| R151 | 1-247-874-00 | CARBON | 62K | 5% | 1/6W | |
| R152 | 1-247-890-00 | CARBON | 300K | 5% | 1/6W | |

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R153 | 1-247-811-00 | CARBON | 150 | 5% | 1/6W | |
| R154 | 1-247-834-00 | CARBON | 1.3K | 5% | 1/6W | |
| R155 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R156 | 1-247-817-00 | CARBON | 270 | 5% | 1/6W | |
| R157 | 1-247-811-00 | CARBON | 150 | 5% | 1/6W | |
| R158 | 1-247-829-00 | CARBON | 820 | 5% | 1/6W | |
| R159 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R160 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R162 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R163 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R164 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R165 | 1-247-834-00 | CARBON | 1.3K | 5% | 1/6W | |
| R166 | 1-247-807-00 | CARBON | 100 | 5% | 1/6W | |
| R167 | 1-247-834-00 | CARBON | 1.3K | 5% | 1/6W | |
| R169 | 1-247-812-00 | CARBON | 160 | 5% | 1/6W | |
| R170 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R171 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R172 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R173 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R177 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R178 | 1-247-825-00 | CARBON | 560 | 5% | 1/6W | |
| R179 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |

### VARIABLE RESISTOR

| | | |
|---|---|---|
| RV001 | 1-226-847-00 | RES, ADJ, CARBON 1K |
| RV002 | 1-226-848-00 | RES, ADJ, CARBON 2.2K |
| RV003 | 1-228-991-00 | RES, ADJ, METAL GLAZE 2.2K |
| RV004 | 1-228-991-00 | RES, ADJ, METAL GLAZE 2.2K |
| RV005 | 1-228-746-00 | RES, ADJ, CARBON 2.2K |
| RV006 | 1-228-753-00 | RES, ADJ, CARBON 470K |
| RV007 | 1-228-745-00 | RES, ADJ, CARBON 1K |
| RV008 | 1-226-851-00 | RES, ADJ, CARBON 10K |
| RV009 | 1-228-750-00 | RES, ADJ, CARBON 47K |
| RV010 | 1-228-750-00 | RES, ADJ, CARBON 47K |
| RV011 | 1-228-994-00 | RES, ADJ, METAL GLAZE 10K |
| RV012 | 1-228-991-00 | RES, ADJ, METAL GLAZE 2.2K |
| RV013 | 1-228-745-00 | RES, ADJ, CARBON 1K |
| RV014 | 1-226-850-00 | RES, ADJ, CARBON 4.7K |

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⚠:A-6711-444-A YC-25 BOARD, COMPLETE
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1-536-796-00 TERMINAL BOARD, CONTROL PANEL

### FILTER

| | | |
|---|---|---|
| BPF001 | 1-235-098-00 | FILTER, BAND PASS |

### CAPACITOR

| | | | | | |
|---|---|---|---|---|---|
| C001 | 1-102-953-00 | CERAMIC | 18PF | 5% | 50V |
| C002 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C003 | 1-102-525-00 | CERAMIC | 68PF | 5% | 50V |
| C004 | 1-102-525-00 | CERAMIC | 68PF | 5% | 50V |

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| C005 | 1-102-110-00 | CERAMIC | 220PF | 10% | 50V |
| C006 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C007 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C008 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C009 | 1-123-356-00 | ELECT | 10MF | 20% | 25V |
| C010 | 1-123-356-00 | ELECT | 10MF | 20% | 25V |
| C011 | 1-123-379-00 | ELECT | 0.47MF | 20% | 50V |
| C012 | 1-123-379-00 | ELECT | 0.47MF | 20% | 50V |
| C013 | 1-108-603-00 | MYLAR | 0.1MF | 5% | 50V |
| C014 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C015 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C016 | 1-101-974-00 | CERAMIC | 20PF | 5% | 50V |
| C017 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C018 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C019 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C021 | 1-101-003-00 | CERAMIC | 0.0047MF | | 50V |
| C022 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C023 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C031 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C032 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C033 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C034 | 1-102-113-00 | CERAMIC | 390PF | 10% | 50V |
| C035 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C036 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C037 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C039 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C041 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C043 | 1-102-508-00 | CERAMIC | 10PF | 0.5PF | 50V |
| C044 | 1-161-025-00 | CERAMIC | 0.1MF | 10% | 25V |
| C045 | 1-161-025-00 | CERAMIC | 0.1MF | 10% | 25V |
| C046 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C047 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C048 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C049 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C050 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C051 | 1-123-332-00 | ELECT | 47MF | 20% | 16V |
| C052 | 1-101-001-00 | CERAMIC | 0.001MF | | 50V |
| C053 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C054 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C055 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C056 | 1-101-001-00 | CERAMIC | 0.001MF | | 50V |
| C057 | 1-131-341-00 | ELECT(SOLID) | 0.1MF | 10% | 25V |
| C058 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C059 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C060 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C061 | 1-102-512-00 | CERAMIC | 16PF | 5% | 50V |
| C062 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C064 | 1-101-001-00 | CERAMIC | 0.001MF | | 50V |
| C070 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C071 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C072 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C073 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C074 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C075 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C076 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C077 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C078 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C079 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C080 | 1-102-947-00 | CERAMIC | 10PF | 5% | 50V |
| C081 | 1-102-529-00 | CERAMIC | 100PF | 5% | 50V |
| C082 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C083 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C084 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C085 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C086 | 1-102-979-00 | CERAMIC | 240PF | 5% | 50V |
| C087 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C088 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C089 | 1-102-947-00 | CERAMIC | 10PF | 5% | 50V |
| C090 | 1-102-947-00 | CERAMIC | 10PF | 5% | 50V |
| C092 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C093 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C094 | 1-102-129-00 | CERAMIC | 0.01MF | 10% | 50V |
| C095 | 1-102-523-00 | CERAMIC | 56PF | 5% | 50V |
| C096 | 1-102-529-00 | CERAMIC | 100PF | 5% | 50V |
| C097 | 1-102-529-00 | CERAMIC | 100PF | 5% | 50V |
| C098 | 1-102-530-00 | CERAMIC | 120PF | 5% | 50V |
| C099 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C100 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C101 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C102 | 1-102-531-00 | CERAMIC | 150PF | 5% | 50V |
| C103 | 1-108-555-00 | MYLAR | 0.001MF | 5% | 50V |
| C104 | 1-108-555-00 | MYLAR | 0.001MF | 5% | 50V |
| C105 | 1-102-947-00 | CERAMIC | 10PF | 5% | 50V |
| C106 | 1-123-306-00 | ELECT | 47MF | 20% | 10V |
| C107 | 1-101-880-00 | CERAMIC | 47PF | 5% | 50V |
| C108 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C109 | 1-161-025-00 | CERAMIC | 0.1MF | 10% | 25V |
| C110 | 1-102-973-00 | CERAMIC | 100PF | 5% | 50V |
| C111 | 1-161-025-00 | CERAMIC | 0.1MF | 10% | 25V |
| C112 | 1-108-595-00 | MYLAR | 0.047MF | 5% | 50V |
| C113 | 1-101-059-00 | CERAMIC | 510PF | 5% | 50V |
| C114 | 1-102-114-00 | CERAMIC | 470PF | 10% | 50V |
| C115 | 1-102-977-00 | CERAMIC | 200PF | 5% | 50V |
| C116 | 1-102-114-00 | CERAMIC | 470PF | 10% | 50V |
| C117 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C118 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C119 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C120 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C121 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C122 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C123 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C124 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C125 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C126 | 1-101-884-00 | CERAMIC | 56PF | 5% | 50V |
| C127 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C128 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |

When indicating parts by reference number, please include the board name.

# YC-25

| Ref.No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| C129 | 1-102-960-00 | CERAMIC | 24PF | 5% | 50V |
| C130 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C131 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C132 | 1-101-884-00 | CERAMIC | 56PF | 5% | 50V |
| C133 | 1-102-937-00 | CERAMIC | 4PF | 0.25PF | 50V |
| C134 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C135 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C136 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C137 | 1-108-569-00 | MYLAR | 0.0039MF | 5% | 50V |
| C138 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C139 | 1-123-332-00 | ELECT | 47MF | 20% | 16V |
| C140 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C141 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C142 | 1-101-005-00 | CERAMIC | 0.022MF | | 50V |
| C143 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C144 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C145 | 1-161-025-00 | CERAMIC | 0.1MF | 10% | 25V |
| C147 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C148 | 1-123-356-00 | ELECT | 10MF | 20% | 25V |
| C150 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C155 | 1-123-311-00 | ELECT | 1000MF | 20% | 10V |
| C157 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C159 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C161 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C162 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C163 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C164 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C167 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |
| C168 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C170 | 1-102-904-00 | CERAMIC | 110PF | 5% | 50V |
| C301 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C303 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C305 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C307 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C308 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C309 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C310 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C311 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C314 | 1-102-978-00 | CERAMIC | 220PF | 5% | 50V |
| C315 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C316 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C317 | 1-102-520-00 | CERAMIC | 39PF | 5% | 50V |
| C318 | 1-101-006-00 | CERAMIC | 0.047MF | | 50V |

### FILTER

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| CF001 | 1-527-874-00 | FILTER, CERAMIC | |
| CF002 | 1-527-875-00 | FILTER, CERAMIC | |

### CONNECTOR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| CN001●: | 1-564-032-00 | PIN, CONNECTOR 7P | |
| CN002●: | 1-564-033-00 | PIN, CONNECTOR 8P | |
| CN003●: | 1-560-891-00 | PIN, CONNECTOR 3P | |
| CN004●: | 1-560-895-41 | PIN, CONNECTOR 7P | |
| CN005●: | 1-560-893-00 | PIN, CONNECTOR 5P | |
| CN006●: | 1-560-892-00 | PIN, CONNECTOR 4P | |
| CN007●: | 1-560-894-00 | PIN, CONNECTOR 6P | |
| CN008●: | 1-560-895-31 | PIN, CONNECTOR 7P | |

### JACK

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| CN009 | 1-507-840-00 | JACK, MINIATURE | |

### TRIMMER

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| CV001 | 1-141-275-00 | CAP, TRIMMER | |

### DIODE

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| D001 | =>8-719-911-19 | DIODE 1SS119 | |
| D004 | 8-719-100-34 | DIODE RD5.6EB1 | |
| D005 | 8-719-000-12 | DIODE MC931 | |
| D009 | 8-719-000-06 | DIODE MC921 | |
| D013 | =>8-719-911-19 | DIODE 1SS119 | |
| D016 | =>8-719-911-19 | DIODE 1SS119 | |
| D017 | =>8-719-911-19 | DIODE 1SS119 | |
| D018 | =>8-719-911-19 | DIODE 1SS119 | |
| D019 | =>8-719-911-19 | DIODE 1SS119 | |
| D020 | =>8-719-911-19 | DIODE 1SS119 | |
| D022 | =>8-719-911-19 | DIODE 1SS119 | |
| D028 | 8-719-100-56 | DIODE RD10EB1 | |
| D031 | =>8-719-911-19 | DIODE 1SS119 | |
| D032 | =>8-719-911-19 | DIODE 1SS119 | |
| D035 | =>8-719-911-19 | DIODE 1SS119 | |
| D036 | =>8-719-911-19 | DIODE 1SS119 | |
| D037 | =>8-719-911-19 | DIODE 1SS119 | |

### DELAY LINE

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| DL001 | 1-415-282-00 | DELAY LINE (2H) | |
| DL002 | 1-415-313-00 | DELAY LINE (1H) | |

### IC

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| IC001 | 8-758-691-00 | IC CX-869A | |
| IC002 | 8-759-208-94 | IC CX-894 | |
| IC003 | 8-759-608-82 | IC CX-882 | |
| IC004 | 8-752-000-80 | IC CX20008 | |
| IC005 | 8-757-945-00 | IC CX-7945 | |
| IC006 | 8-759-600-08 | IC CX-870A | |
| IC009 | 8-759-208-94 | IC CX-894 | |
| IC010 | 8-759-273-20 | IC TA7320P | |
| IC011 | 8-759-240-13 | IC TC4013BP | |
| IC012 | 8-759-240-69 | IC TC4069UBP | |
| IC013 | 8-759-208-67 | IC CX-867 | |
| IC014 | 8-759-908-68 | IC CX-868 | |
| IC015 | =>8-750-000-74 | IC CX20061 | |
| IC016 | 8-759-979-26 | IC CX-7926 | |

### COIL

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| L001 | 1-408-420-00 | MICRO INDUCTOR 82UH | |
| L002 | 1-408-427-00 | MICRO INDUCTOR 330UH | |
| L003 | 1-407-503-00 | MICRO INDUCTOR 8.2MMH | |
| L004 | 1-408-408-00 | MICRO INDUCTOR 8.2UH | |

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| L005 | 1-408-429-00 | MICRO INDUCTOR 470UH | |
| L006 | 1-407-503-00 | MICRO INDUCTOR 8.2MMH | |
| L007 | 1-408-412-00 | MICRO INDUCTOR 18UH | |
| L008 | 1-408-426-00 | MICRO INDUCTOR 270UH | |
| L009 | 1-408-429-00 | MICRO INDUCTOR 470UH | |
| L010 | 1-407-503-00 | MICRO INDUCTOR 8.2MMH | |
| L011 | 1-408-408-00 | MICRO INDUCTOR 8.2UH | |
| L012 | 1-408-406-00 | MICRO INDUCTOR 5.6UH | |
| L013 | 1-407-496-00 | MICRO INDUCTOR 2.2MMH | |
| L014 | 1-407-500-00 | MICRO INDUCTOR 4.7MMH | |
| L015 | 1-407-163-XX | MICRO INDUCTOR 33UH | |

### FILTER

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| LPF001 | 1-235-097-00 | FILTER, LOW PASS | |

### VAIABLE COIL

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| LV002 | 1-408-512-00 | COIL (VARIABLE) | |

### VOLUME BLOCK

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| PS001⚠ | 1-532-685-00 | LINK, IC | |

### TRANSISTOR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| Q001 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q002 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q003 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q006 | 8-729-603-50 | TRANSISTOR 2SC403SP | |
| Q007 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q008 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q009 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q013 | 8-729-603-50 | TRANSISTOR 2SC403SP | |
| Q014 | 8-729-603-50 | TRANSISTOR 2SC403SP | |
| Q015 | 8-729-603-50 | TRANSISTOR 2SC403SP | |
| Q017 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q019 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q020 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q021 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q024 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q025 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q026 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q027 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q028 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q029 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q030 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q031 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q033 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q034 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q035 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q036 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q037 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q038 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q039 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q040 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q041 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q042 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q043 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q044 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q045 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q046 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q047 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q048 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q049 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q050 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q051 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q052 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q053 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q054 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q055 | 8-729-113-32 | TRANSISTOR 2SB733 | |
| Q056 | 8-729-113-32 | TRANSISTOR 2SB733 | |
| Q068 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q069 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q072 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |

### RESISTOR

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R001 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R002 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R003 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R004 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R005 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R006 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R007 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R008 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R009 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R010 | 1-247-870-00 | CARBON | 43K | 5% | 1/6W | |
| R011 | 1-247-865-00 | CARBON | 27K | 5% | 1/6W | |
| R012 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R018 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R019 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R020 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R021 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R022 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R023 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R024 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R025 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R026 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R027 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R028 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R029 | 1-247-852-00 | CARBON | 7.5K | 5% | 1/6W | |
| R044 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R045 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R047 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R048 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R049 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R050 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R051 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R052 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

# YC-25

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R053 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R054 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R055 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R057 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R059 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R063 | 1-247-841-00 | CARBON | 2.7K | 5% | 1/6W | |
| R064 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R066 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R067 | 1-247-886-00 | CARBON | 200K | 5% | 1/6W | |
| R068 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R069 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R070 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R071 | 1-247-858-00 | CARBON | 13K | 5% | 1/6W | |
| R072 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R073 | 1-247-862-00 | CARBON | 20K | 5% | 1/6W | |
| R074 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R075 | 1-247-842-00 | CARBON | 3K | 5% | 1/6W | |
| R076 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R077 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R078 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R079 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R080 | 1-247-864-00 | CARBON | 24K | 5% | 1/6W | |
| R081 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R082 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R083 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R084 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R085 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R086 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W | |
| R087 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R088 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R099 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R100 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R101 | 1-247-866-00 | CARBON | 30K | 5% | 1/6W | |
| R102 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R103 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R104 | 1-247-807-00 | CARBON | 100 | 5% | 1/6W | |
| R105 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R106 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R107 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R108 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R109 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R110 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R111 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R112 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R113 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R114 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R115 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R116 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R117 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R119 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R120 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R121 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R123 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R124 | 1-247-825-00 | CARBON | 560 | 5% | 1/6W | |
| R125 | 1-247-860-00 | CARBON | 16K | 5% | 1/6W | |
| R126 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R127 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R128 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R129 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R130 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R131 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R132 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R133 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R134 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R135 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R136 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R137 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R138 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R139 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W | |
| R140 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W | |
| R141 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R142 | 1-247-864-00 | CARBON | 24K | 5% | 1/6W | |
| R143 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R144 | 1-247-826-00 | CARBON | 620 | 5% | 1/6W | |
| R145 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R146 | 1-247-844-00 | CARBON | 3.6K | 5% | 1/6W | |
| R147 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R148 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R149 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R150 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R151 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R152 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R153 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R154 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R155 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R156 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R157 | 1-247-824-00 | CARBON | 510 | 5% | 1/6W | |
| R158 | 1-247-815-00 | CARBON | 220 | 5% | 1/6W | |
| R159 | 1-247-848-00 | CARBON | 5.1K | 5% | 1/6W | |
| R160 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R161 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R162 | 1-247-841-00 | CARBON | 2.7K | 5% | 1/6W | |
| R163 | 1-247-850-00 | CARBON | 6.2K | 5% | 1/6W | |
| R164 | 1-247-848-00 | CARBON | 5.1K | 5% | 1/6W | |
| R165 | 1-247-841-00 | CARBON | 2.7K | 5% | 1/6W | |
| R166 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R167 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R168 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R169 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R170 | 1-247-882-00 | CARBON | 130K | 5% | 1/6W | |
| R171 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R172 | 1-247-895-00 | CARBON | 470K | 5% | 1/6W | |
| R173 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R174 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R175 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R176 | 1-247-878-00 | CARBON | 91K | 5% | 1/6W | |

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R177 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R178 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R179 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R180 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R181 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R182 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R183 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R184 | 1-247-828-00 | CARBON | 750 | 5% | 1/6W | |
| R185 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R186 | 1-247-830-00 | CARBON | 910 | 5% | 1/6W | |
| R187 | 1-247-853-00 | CARBON | 8.2K | 5% | 1/6W | |
| R188 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R189 | 1-247-858-00 | CARBON | 13K | 5% | 1/6W | |
| R190 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R191 | 1-247-882-00 | CARBON | 130K | 5% | 1/6W | |
| R192 | 1-247-887-00 | CARBON | 220K | 5% | 1/6W | |
| R193 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R194 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R195 | 1-247-830-00 | CARBON | 910 | 5% | 1/6W | |
| R196 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R197 | 1-247-822-00 | CARBON | 430 | 5% | 1/6W | |
| R198 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R199 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R200 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R201 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R202 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R203 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R204 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R205 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R206 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R207 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R209 | 1-247-814-00 | CARBON | 200 | 5% | 1/6W | |
| R210 | 1-247-808-00 | CARBON | 110 | 5% | 1/6W | |
| R211 | 1-247-833-00 | CARBON | 1.2K | 5% | 1/6W | |
| R212 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R213 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R214 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R215 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R216 | 1-247-858-00 | CARBON | 13K | 5% | 1/6W | |
| R217 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R218 | 1-247-841-00 | CARBON | 2.7K | 5% | 1/6W | |
| R219 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R220 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R221 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R222 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R223 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R224 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R225 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R227 | 1-247-803-00 | CARBON | 68 | 5% | 1/6W | |
| R236 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R240 | 1-247-804-00 | CARBON | 75 | 5% | 1/6W | |
| R258 | 1-247-844-00 | CARBON | 3.6K | 5% | 1/6W | |
| R259 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R264 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R265 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R266 | 1-247-818-00 | CARBON | 300 | 5% | 1/6W | |
| R267 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R270 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R271 ⚠ | 1-212-849-00 | FUSIBLE | 4.7 | 5% | 1/4W | F |
| R272 | 1-247-803-00 | CARBON | 68 | 5% | 1/6W | |
| R273 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R276 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R278 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R280 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R281 | 1-247-807-00 | CARBON | 100 | 5% | 1/6W | |
| R282 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R304 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R311 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R312 | 1-247-846-00 | CARBON | 4.3K | 5% | 1/6W | |
| R315 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R316 | 1-247-900-00 | CARBON | 750K | 5% | 1/6W | |

### VARIABLE RESISTOR

| | | |
|---|---|---|
| RV001 | 1-228-749-00 | RES, ADJ, CARBON 22K |
| RV002 | 1-228-746-00 | RES, ADJ, CARBON 2.2K |
| RV003 | 1-228-744-00 | RES, ADJ, CARBON 470 |
| RV004 | 1-228-995-00 | RES, ADJ, METAL GLAZE 22K |
| RV005 | 1-228-748-00 | RES, ADJ, CARBON 10K |
| RV006 | 1-228-995-00 | RES, ADJ, METAL GLAZE 22K |
| RV008 | 1-228-993-00 | RES, ADJ, METAL GLAZE 4.7K |
| RV009 | 1-228-750-00 | RES, ADJ, CARBON 47K |
| RV010 | 1-228-750-00 | RES, ADJ, CARBON 47K |
| RV011 | 1-228-750-00 | RES, ADJ, CARBON 47K |
| RV012 | 1-228-991-00 | RES, ADJ, METAL GLAZE 2.2K |
| RV013 | 1-228-989-00 | RES, ADJ, METAL GLAZE 470 |

### TRANSFORMER

T001 1-426-093-00 COIL, REC C BPT

### CRYSTAL

X001 1-527-345-00 CRYSTAL, OSC

*****************************************************************

♠:A-6713-175-A AM-3 BOARD, COMPLETE
********************

♠:3-681-180-00 CASE (MAIN), SHIELD, AM
♠:3-681-182-00 LID, BOTTOM, SHIELD CASE, AM

### CAPACITOR

| | | | | | |
|---|---|---|---|---|---|
| C501 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C503 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C504 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C505 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C506 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

# AM-3

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C507 | 1-123-333-00 | ELECT | 100MF | 20% | 16V | |
| C508 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V | |
| C509 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V | |
| C510 | 1-130-497-00 | MYLAR | 0.15MF | 5% | 50V | |
| C511 | 1-130-486-51 | MYLAR | 0.018MF | 5% | 50V | |
| C512 | 1-123-333-00 | ELECT | 100MF | 20% | 16V | |
| C513 | 1-123-379-00 | ELECT | 0.47MF | 20% | 50V | |
| C514 | 1-123-330-00 | ELECT | 22MF | 20% | 16V | |
| C515 | 1-102-111-00 | CERAMIC | 270PF | 10% | 50V | |
| C516 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V | |
| C517 | 1-130-507-51 | MYLAR | 0.0018MF | 10% | 50V | |
| C518 | 1-123-305-00 | ELECT | 33MF | 20% | 10V | |
| C519 | 1-130-516-51 | MYLAR | 0.01MF | 10% | 50V | |
| C520 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V | |
| C521 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V | |
| C522 | 1-123-333-00 | ELECT | 100MF | 20% | 16V | |
| C524 | 1-127-468-00 | ELECT(SOLID) | 0.22MF | 5% | 16V | |
| C525 | 1-130-507-51 | MYLAR | 0.0018MF | 10% | 50V | |
| C526 | 1-123-332-00 | ELECT | 47MF | 20% | 16V | |
| C527 | 1-130-479-00 | MYLAR | 0.0047MF | 5% | 50V | |
| C528 | 1-130-477-00 | MYLAR | 0.0033MF | 5% | 50V | |
| C529 | 1-129-709-00 | FILM | 0.0039MF | 10% | 630V | |
| C530 | 1-102-108-00 | CERAMIC | 150PF | 10% | 50V | |
| C531 | 1-123-333-00 | ELECT | 100MF | 20% | 16V | |
| C532 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | |
| C533 | 1-130-518-51 | MYLAR | 0.015MF | 10% | 50V | |
| C534 | 1-123-332-00 | ELECT | 47MF | 20% | 16V | |
| C535 | 1-102-111-00 | CERAMIC | 270PF | 10% | 50V | |

### CONNECTOR

| Ref.No. | Part No. | Description |
|---|---|---|
| CN501♠: | 1-560-894-00 | PIN, CONNECTOR 6P |
| CN502♠: | 1-560-895-00 | PIN, CONNECTOR 7P |
| CN504♠: | 1-564-030-31 | PIN, CONNECTOR 5P |
| CN505♠: | 1-560-890-00 | PIN, CONNECTOR 2P |

### TRIMMER

| Ref.No. | Part No. | Description |
|---|---|---|
| CT501 | 1-141-215-00 | CAP, TRIMMER |

### DIODE

| Ref.No. | Part No. | Description |
|---|---|---|
| D502 | 8-719-911-19 | DIODE 1SS119 |
| D503 | 8-719-911-06 | DIODE 1SS106 |
| D504 | 8-719-911-19 | DIODE 1SS119 |
| D506 | 8-719-911-19 | DIODE 1SS119 |
| D507 | =>8-719-200-02 | DIODE 10E-2 |
| D508 | 8-719-812-31 | DIODE TLR123 |

### IC

| Ref.No. | Part No. | Description |
|---|---|---|
| IC501 | 8-759-800-46 | IC LA7046 |
| IC502 | 8-750-000-74 | IC CX20061 |

### COIL

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| L501 | 1-407-963-00 | MICRO INDUCTOR 15MMH | |
| L502 | 1-408-221-00 | MICRO INDUCTOR 22MMH | |
| L503 | 1-407-710-00 | MICRO INDUCTOR 270UH | |
| L504 | 1-408-221-00 | MICRO INDUCTOR 22MMH | |

### TRANSISTOR

| Ref.No. | Part No. | Description |
|---|---|---|
| Q501 | 8-729-988-12 | TRANSISTOR 2SA881 |
| Q502 | =>8-729-245-83 | TRANSISTOR 2SC2458 |
| Q503 | =>8-729-178-55 | TRANSISTOR 2SC2785-E |
| Q504 | 8-729-967-32 | TRANSISTOR 2SC2673 |
| Q505 | 8-729-194-47 | TRANSISTOR 2SC945-P |
| Q506 | 8-729-194-47 | TRANSISTOR 2SC945-P |
| Q507 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR |
| Q508 | =>8-729-245-83 | TRANSISTOR 2SC2458 |
| Q509 | =>8-729-245-83 | TRANSISTOR 2SC2458 |
| Q510 | =>8-729-178-55 | TRANSISTOR 2SC2785-E |
| Q511 | =>8-729-245-83 | TRANSISTOR 2SC2458 |
| Q512 | =>8-729-178-54 | TRANSISTOR 2SC2785-E |

### RESISTOR

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R501 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R502 | 1-247-864-00 | CARBON | 24K | 5% | 1/6W | |
| R503 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R504 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R505 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R506 ⚠ | 1-247-660-00 | CARBON | 82 | 5% | 1/4W | F |
| R507 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R508 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R509 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R510 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R511 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R512 | 1-247-791-00 | CARBON | 22 | 5% | 1/6W | |
| R513 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R514 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R515 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R516 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R517 | 1-210-825-00 | SOLID | 3.3M | 5% | 1/4W | |
| R518 | 1-247-851-00 | CARBON | 6.8K | 5% | 1/6W | |
| R519 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R520 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R521 | 1-247-891-00 | CARBON | 330K | 5% | 1/6W | |
| R522 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R524 | 1-247-783-00 | CARBON | 10 | 5% | 1/6W | |
| R525 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R526 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R527 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R528 | 1-247-853-00 | CARBON | 8.2K | 5% | 1/6W | |
| R529 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R530 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R531 | 1-247-829-00 | CARBON | 820 | 5% | 1/6W | |
| R532 | 1-247-862-00 | CARBON | 20K | 5% | 1/6W | |
| R533 ⚠ | 1-246-980-00 | CARBON | 3.3 | 5% | 1/8W | F |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R534 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R535 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R536 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R537 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R538 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R539 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R540 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R541 | 1-247-877-00 | CARBON | 82K | 5% | 1/6W | |
| R542 | 1-247-865-00 | CARBON | 27K | 5% | 1/6W | |
| R543 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R544 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R545 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R546 | 1-247-841-00 | CARBON | 2.7K | 5% | 1/6W | |
| R547 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R548 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R549 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R550 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |

### VARIABLE RESISTOR

| | | |
|---|---|---|
| RV501 | 1-228-748-00 | RES, ADJ, CARBON 10K |
| RV502 | 1-228-744-00 | RES, ADJ, CARBON 470 |
| RV503 | 1-228-751-00 | RES, ADJ, CARBON 100K |

### TRANSFORMER

| | | |
|---|---|---|
| T501 | 1-433-237-00 | TRANSFORMER, OSCILLATOR |

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♠:A-6715-187-A SS-16 BOARD, COMPLETE
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♠:3-681-170-00 HEAT SINK, S

### CAPACITOR

| | | | | | |
|---|---|---|---|---|---|
| C301 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C302 | 1-130-516-51 | MYLAR | 0.01MF | 10% | 50V |
| C303 | 1-130-516-51 | MYLAR | 0.01MF | 10% | 50V |
| C304 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C305 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C306 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C307 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C308 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C309 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C310 | 1-130-516-51 | MYLAR | 0.01MF | 10% | 50V |
| C311 | 1-123-296-00 | ELECT | 220MF | 20% | 6.3V |
| C312 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C313 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C314 | 1-123-306-00 | ELECT | 47MF | 20% | 10V |
| C315 | 1-108-605-00 | MYLAR | 0.12MF | 5% | 50V |
| C316 | 1-127-468-00 | ELECT(SOLID) | 0.22MF | 5% | 16V |
| C317 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C318 | 1-130-479-00 | MYLAR | 0.0047MF | 5% | 50V |
| C319 | 1-102-106-00 | CERAMIC | 100PF | 10% | 50V |
| C320 | 1-123-381-00 | ELECT | 2.2MF | 20% | 50V |

| Ref.No. | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| C321 | 1-123-296-00 | ELECT | 220MF | 20% | 6.3V |
| C322 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C323 | 1-131-357-00 | TANTALUM | 4.7MF | 20% | 25V |
| C324 | 1-123-381-00 | ELECT | 2.2MF | 20% | 50V |
| C325 | 1-131-357-00 | TANTALUM | 4.7MF | 20% | 25V |
| C326 | 1-123-381-00 | ELECT | 2.2MF | 20% | 50V |
| C327 | 1-161-016-00 | CERAMIC | 0.018MF | 10% | 25V |
| C328 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C329 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C330 | 1-161-016-00 | CERAMIC | 0.018MF | 10% | 25V |
| C331 | 1-161-016-00 | CERAMIC | 0.018MF | 10% | 25V |
| C332 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C333 | 1-131-354-00 | TANTALUM | 1.5MF | 10% | 25V |
| C334 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C335 | 1-161-017-00 | CERAMIC | 0.022MF | 10% | 25V |
| C336 | 1-161-002-00 | CERAMIC | 0.0012MF | 10% | 25V |
| C337 | 1-161-016-00 | CERAMIC | 0.018MF | 10% | 25V |
| C338 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C339 | 1-161-016-00 | CERAMIC | 0.018MF | 10% | 25V |
| C340 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C341 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C342 | 1-161-019-00 | CERAMIC | 0.033MF | 10% | 25V |
| C343 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C344 | 1-161-019-00 | CERAMIC | 0.033MF | 10% | 25V |
| C345 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C346 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C347 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C348 | 1-127-472-00 | ELECT(SOLID) | 1MF | 5% | 16V |
| C350 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C351 | 1-123-306-00 | ELECT | 47MF | 20% | 10V |
| C352 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C355 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V |
| C356 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C357 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C358 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C360 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C361 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C362 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C363 | 1-123-332-00 | ELECT | 47MF | 20% | 16V |
| C365 | 1-131-354-00 | TANTALUM | 1.5MF | 10% | 25V |
| C601 | 1-161-021-00 | CERAMIC | 0.047MF | 10% | 25V |
| C602 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C603 | 1-129-794-00 | FILM | 0.0033MF | 5% | 100V |
| C604 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C605 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C606 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C607 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C608 | 1-161-494-00 | CERAMIC | 0.022MF | 30% | 25V |
| C609 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C610 | 1-161-002-00 | CERAMIC | 0.0012MF | 10% | 25V |
| C611 | 1-161-002-00 | CERAMIC | 0.0012MF | 10% | 25V |
| C612 | 1-102-517-00 | CERAMIC | 30PF | 5% | 50V |
| C613 | 1-102-517-00 | CERAMIC | 30PF | 5% | 50V |

When indicating parts by reference number, please include the board name.

## SS-16

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| C614 | 1-123-331-00 | ELECT 33MF 20% 25V | |
| C615 | 1-123-331-00 | ELECT 33MF 20% 25V | |
| C617 | 1-123-380-00 | ELECT 1MF 20% 50V | |
| C618 | 1-123-306-00 | ELECT 47MF 20% 10V | |
| C801 | 1-161-017-00 | CERAMIC 0.022MF 10% 25V | |

### FILTER

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| CF601 | 1-527-822-00 | OSCILLATOR, CERAMIC | |

### CONNECTOR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| CN301♠: | 1-560-892-00 | PIN, CONNECTOR 4P | |
| CN302♠ | 1-560-466-00 | PIN, CONNECTOR 3P | |
| CN303♠: | 1-560-892-31 | PIN, CONNECTOR 4P | |
| CN304♠: | 1-560-892-41 | PIN, CONNECTOR 4P | |
| CN305♠: | 1-560-890-31 | PIN, CONNECTOR 2P | |
| CN306♠: | 1-560-895-41 | PIN, CONNECTOR 7P | |
| CN307♠: | 1-560-890-00 | PIN, CONNECTOR 2P | |
| CN308♠: | 1-560-892-21 | PIN, CONNECTOR 4P | |
| CN309♠: | 1-560-895-21 | PIN, CONNECTOR 7P | |
| CN310♠: | 1-560-891-00 | PIN, CONNECTOR 3P | |
| CN311♠: | 1-560-891-31 | PIN, CONNECTOR 3P | |
| CN312♠: | 1-560-895-31 | PIN, CONNECTOR 7P | |
| CN602♠: | 1-560-899-00 | PIN, CONNECTOR 11P | |
| CN603♠: | 1-560-890-00 | PIN, CONNECTOR 2P | |
| CN604♠: | 1-560-891-00 | PIN, CONNECTOR 3P | |
| CN605♠: | 1-560-890-21 | PIN, CONNECTOR 2P | |
| CN606♠: | 1-560-892-00 | PIN, CONNECTOR 4P | |
| CN607♠: | 1-560-890-41 | PIN, CONNECTOR 2P | |
| CN608♠: | 1-560-892-31 | PIN, CONNECTOR 4P | |
| CN609♠: | 1-560-893-00 | PIN, CONNECTOR 5P | |
| CN610♠: | 1-560-891-41 | PIN, CONNECTOR 3P | |
| CN611♠: | 1-560-891-21 | PIN, CONNECTOR 3P | |
| CN613♠: | 1-560-894-00 | PIN, CONNECTOR 6P | |
| CN614♠: | 1-560-896-00 | PIN, CONNECTOR 8P | |
| CN615♠: | 1-560-895-00 | PIN, CONNECTOR 7P | |

### DIODE

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| D301 | 8-719-100-57 | DIODE RD10EB2 | |
| D302 | 8-719-000-06 | DIODE MC921 | |
| D304 | 8-719-911-19 | DIODE 1SS119 | |
| D306 | 8-719-000-06 | DIODE MC921 | |
| D308 | 8-719-911-19 | DIODE 1SS119 | |
| D309 | 8-719-911-19 | DIODE 1SS119 | |
| D311 | 8-719-911-19 | DIODE 1SS119 | |
| D313 | 8-719-911-19 | DIODE 1SS119 | |
| D314 | 8-719-911-19 | DIODE 1SS119 | |
| D315 | 8-719-911-19 | DIODE 1SS119 | |
| D316 | 8-719-911-19 | DIODE 1SS119 | |
| D317 | 8-719-911-19 | DIODE 1SS119 | |
| D325 | 8-719-000-04 | DIODE MC911 | |
| D326 | 8-719-162-07 | DIODE RD6.2E-B | |
| D327 | 8-719-200-02 | DIODE 10E-2 | |
| D328 | 8-719-000-06 | DIODE MC921 | |
| D335 | 8-719-911-19 | DIODE 1SS119 | |
| D339 | 8-719-911-19 | DIODE 1SS119 | |
| D340 | 8-719-911-19 | DIODE 1SS119 | |
| D341 | 8-719-812-31 | DIODE TLR123 | |
| D607 | 8-719-911-19 | DIODE 1SS119 | |
| D608 | 8-719-000-12 | DIODE MC931 | |
| D610 | 8-719-911-19 | DIODE 1SS119 | |
| D612 | 8-719-911-19 | DIODE 1SS119 | |
| D613 | 8-719-911-19 | DIODE 1SS119 | |
| D614 | 8-719-911-19 | DIODE 1SS119 | |
| D616 | 8-719-911-19 | DIODE 1SS119 | |
| D617 | 8-719-911-19 | DIODE 1SS119 | |

### IC

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| IC301 | 8-751-941-00 | IC CX-194B-0 | |
| IC302 | 8-759-135-80 | IC UPC358C | |
| IC303 | 8-759-145-58 | IC UPC4558C | |
| IC304 | 8-759-132-40 | IC UPC324C | |
| IC305 | 8-759-240-53 | IC TC4053BP | |
| IC306 | 8-759-132-40 | IC UPC324C | |
| IC307 | 8-759-240-53 | IC TC4053BP | |
| IC308 | 8-759-135-80 | IC UPC358C | |
| IC601 | 8-759-908-37 | IC MB88421-113M | |

### COIL

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| L601 | 1-408-418-21 | MICRO INDUCTOR 56UH | |

### VOLUME BLOCK

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| PS301⚠ | 1-532-637-00 | LINK, IC | |
| PS302⚠ | 1-532-679-00 | LINK, IC | |

### TRANSISTOR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| Q301 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q302 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q303 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q304 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q305 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q306 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q307 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q309 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q310 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q311 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q312 | =>8-729-177-43 | TRANSISTOR 2SD774 | |
| Q313 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| ⚠Q314 | 8-729-805-13 | TRANSISTOR 2SC1475-13 | |
| Q315 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q316 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q317 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q318 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q319 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q320 | 8-729-316-16 | TRANSISTOR 2SC1061 | |
| Q321 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| Q322 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q324 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q325 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q326 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q327 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q330 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q331 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q332 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q333 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q334 | 8-729-316-16 | TRANSISTOR 2SC1061 | |
| Q335 | =>8-729-177-32 | TRANSISTOR 2SD773 | |
| Q336 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q337 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q338 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q339 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q340 | 8-729-374-02 | TRANSISTOR 2SB740 | |
| Q341 | 8-729-374-02 | TRANSISTOR 2SB740 | |
| Q342 | =>8-729-177-43 | TRANSISTOR 2SD774 | |
| Q343 | =>8-729-177-43 | TRANSISTOR 2SD774 | |
| Q344 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q345 | =>8-729-177-43 | TRANSISTOR 2SD774 | |
| Q346 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q347 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q348 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q349 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q352 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q354 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q355 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q356 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q357 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q358 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q359 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q360 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q362 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q363 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q364 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q365 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q366 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q367 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q368 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q370 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q371 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q372 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q373 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q604 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q605 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q606 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q607 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q608 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q609 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q610 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q611 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q612 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| Q613 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q614 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q615 | =>8-729-177-43 | TRANSISTOR 2SD774 | |
| Q616 | 8-729-116-42 | TRANSISTOR 2SD1164 | |
| Q617 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q618 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q619 | =>8-729-177-43 | TRANSISTOR 2SD774 | |
| Q620 | 8-729-116-42 | TRANSISTOR 2SD1164 | |
| Q621 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q622 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q623 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q624 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q625 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q626 | =>8-729-987-42 | TRANSISTOR 2SA874 | |
| Q627 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q628 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q629 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q630 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q631 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q632 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q633 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q634 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q636 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |

### RESISTOR

| | | | | | | |
|---|---|---|---|---|---|---|
| R301 ⚠ | 1-212-855-00 | FUSIBLE | 8.2 | 5% | 1/4W | F |
| R302 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R303 | 1-206-482-00 | METAL OXIDE | 62 | 5% | 2W | F |
| R304 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R305 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R306 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R307 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R308 | 1-247-866-00 | CARBON | 30K | 5% | 1/6W | |
| R309 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R310 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R312 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R313 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R314 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R315 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R316 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R317 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R318 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R319 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R320 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R321 ⚠ | 1-212-850-00 | FUSIBLE | 5.1 | 5% | 1/4W | F |
| R322 | 1-247-865-00 | CARBON | 27K | 5% | 1/6W | |
| R323 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R324 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R325 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R326 | 1-247-829-00 | CARBON | 820 | 5% | 1/6W | |
| R327 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R328 | 1-247-835-00 | CARBON | 1.5K | 5% | 1/6W | |
| R329 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

# SS-16

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R331 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R332 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R333 | 1-247-891-00 | CARBON | 330K | 5% | 1/6W | |
| R334 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R335 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R336 | 1-247-891-00 | CARBON | 330K | 5% | 1/6W | |
| R338 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R339 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R340 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R341 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R342 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R343 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R344 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R345 | 1-247-887-00 | CARBON | 220K | 5% | 1/6W | |
| R346 | 1-247-887-00 | CARBON | 220K | 5% | 1/6W | |
| R347 | 1-247-865-00 | CARBON | 27K | 5% | 1/6W | |
| R348 | 1-247-865-00 | CARBON | 27K | 5% | 1/6W | |
| R349 | 1-247-851-00 | CARBON | 6.8K | 5% | 1/6W | |
| R350 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R351 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R352 | 1-247-865-00 | CARBON | 27K | 5% | 1/6W | |
| R353 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R359 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R360 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R361 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R362 | 1-247-872-00 | CARBON | 51K | 5% | 1/6W | |
| R363 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R364 | 1-247-900-00 | CARBON | 750K | 5% | 1/6W | |
| R365 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R367 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R368 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R369 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R370 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R371 ⚠ | 1-212-360-00 | METAL OXIDE | 1 | 5% | 1W | F |
| R372 ⚠ | 1-246-981-00 | CARBON | 4.7 | 5% | 1/8W | F |
| R373 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R374 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R375 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R376 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R377 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R378 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R379 | 1-247-887-00 | CARBON | 220K | 5% | 1/6W | |
| R380 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R381 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R382 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R383 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R384 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R385 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R386 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R387 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R388 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R389 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R390 | 1-247-868-00 | CARBON | 36K | 5% | 1/6W | |

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R391 | 1-247-866-00 | CARBON | 30K | 5% | 1/6W | |
| R392 | 1-247-832-00 | CARBON | 1.1K | 5% | 1/6W | |
| R393 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R394 | 1-247-897-00 | CARBON | 560K | 5% | 1/6W | |
| R395 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R396 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R398 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R399 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R400 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W | |
| R401 ⚠ | 1-212-360-00 | METAL OXIDE | 1 | 5% | 1W | F |
| R402 ⚠ | 1-246-981-00 | CARBON | 4.7 | 5% | 1/8W | F |
| R403 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R404 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R405 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R406 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R407 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R408 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R410 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R413 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R414 | 1-247-850-00 | CARBON | 6.2K | 5% | 1/6W | |
| R415 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R416 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R417 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R419 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R420 ⚠ | 1-212-366-00 | METAL OXIDE | 3.3 | 5% | 1W | F |
| R421 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R422 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R423 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R424 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R425 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R426 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R427 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R428 | 1-244-865-00 | CARBON | 470 | 5% | 1/2W | |
| R429 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R430 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R431 ⚠ | 1-212-360-00 | METAL OXIDE | 1 | 5% | 1W | F |
| R432 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R433 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R434 | 1-244-865-00 | CARBON | 470 | 5% | 1/2W | |
| R435 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R436 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R437 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R438 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R439 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R440 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R441 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R442 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R443 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R444 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R448 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R449 | 1-247-897-00 | CARBON | 560K | 5% | 1/6W | |
| R451 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R454 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R455 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R456 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R457 ⚠ | 1-246-981-00 | CARBON | 4.7 | 5% | 1/8W | F |
| R458 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R459 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R460 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R461 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R462 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R466 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R467 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R468 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R469 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R470 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R473 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R474 ⚠ | 1-212-857-00 | FUSIBLE | 10 | 5% | 1/4W | F |
| R475 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R476 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R477 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R478 | 1-246-469-00 | CARBON | 680 | 1% | 1/4W | |
| R479 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R480 | 1-247-795-00 | CARBON | 33 | 5% | 1/6W | |
| R481 | 1-247-808-00 | CARBON | 110 | 5% | 1/6W | |
| R482 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R483 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R484 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R485 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R492 | 1-247-853-00 | CARBON | 8.2K | 5% | 1/6W | |
| R493 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R494 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R495 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R496 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R497 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R498 | 1-247-808-00 | CARBON | 110 | 5% | 1/6W | |
| R499 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R500 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R501 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R502 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R503 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R504 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R505 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R506 | 1-247-863-00 | CARBON | 22K | | 1/6W | |
| R507 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R508 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R509 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R511 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R512 | 1-246-467-00 | CARBON | 560 | 1% | 1/4W | |
| R513 | 1-246-470-00 | CARBON | 750 | 5% | 1/4W | |
| R514 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R515 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R516 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R517 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R518 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R519 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R520 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R521 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R522 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R523 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R524 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R525 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R527 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R528 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R555 | 1-247-880-00 | CARBON | 110K | | 1/6W | |
| R557 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R559 | 1-247-865-00 | CARBON | 27K | 5% | 1/6W | |
| R610 | 1-247-817-00 | CARBON | 270 | 5% | 1/6W | |
| R611 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R612 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R613 | 1-247-886-00 | CARBON | 200K | 5% | 1/6W | |
| R614 | 1-247-841-00 | CARBON | 2.7K | 5% | 1/6W | |
| R615 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R616 | 1-247-841-00 | CARBON | 2.7K | 5% | 1/6W | |
| R617 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R618 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R619 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R620 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R621 | 1-247-815-00 | CARBON | 220 | 5% | 1/6W | |
| R622 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R623 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R624 | 1-247-801-00 | CARBON | 56 | 5% | 1/6W | |
| R625 | 1-247-852-00 | CARBON | 7.5K | 5% | 1/6W | |
| R627 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R628 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R629 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R630 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R631 | 1-247-895-00 | CARBON | 470K | 5% | 1/6W | |
| R632 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R633 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R634 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R635 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R636 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R637 | 1-247-827-00 | CARBON | 680 | 5% | 1/6W | |
| R638 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R639 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R640 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R641 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R642 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R643 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R644 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R645 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R647 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R648 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R649 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R650 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R652 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R653 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R654 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R655 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

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| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R656 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R657 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R658 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R659 | 1-247-865-00 | CARBON | 27K | 5% | 1/6W | |
| R660 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R661 | 1-247-809-00 | CARBON | 120 | 5% | 1/6W | |
| R662 | 1-247-829-00 | CARBON | 820 | 5% | 1/6W | |
| R663 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R664 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R665 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R666 | 1-247-807-00 | CARBON | 100 | 5% | 1/6W | |
| R667 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R672 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R673 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R674 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R675 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R676 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R677 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R678 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R679 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R681 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R682 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R683 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R690 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R691 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R692 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R693 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R694 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R695 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R701 | 1-247-846-00 | CARBON | 4.3K | 5% | 1/6W | |
| R702 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R703 | 1-247-871-00 | CARBON | 47K | 5% | 1/6W | |
| R704 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R705 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R706 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R707 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R708 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R709 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R801 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R802 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R803 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R804 | 1-247-871-00 | CARBON | 47K | | 1/6W | |

VARIABLE RESISTOR

| Ref.No. | Part No. | Description |
|---|---|---|
| RV301 | 1-228-750-00 | RES, ADJ, CARBON 47K |
| RV302 | 1-228-750-00 | RES, ADJ, CARBON 47K |
| RV303 | 1-224-254-00 | RES, ADJ, METAL GLAZE 47K |
| RV304 | 1-228-750-00 | RES, ADJ, CARBON 47K |
| RV307 | 1-228-994-00 | RES, ADJ, METAL GLAZE 10K |
| RV308 | 1-228-994-00 | RES, ADJ, METAL GLAZE 10K |
| RV309 | 1-228-991-00 | RES, ADJ, CARBON 2.2K |
| RV310 | 1-228-991-00 | RES, ADJ, METAL GLAZE 2.2K |

THERMISTOR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| TH302 | 1-800-202-XX | THERMISTOR S-10K | |
| TH303 | 1-800-202-XX | THERMISTOR S-10K | |
| TH304 | 1-800-202-XX | THERMISTOR S-10K | |

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♠:1-610-406-12 FU-14 BOARD
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♠:3-674-313-00 COVER, LED
♠:3-674-372-00 HOLDER (A), LED

DIODE

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| D701 | 8-719-812-30 | DIODE TL0123 | |
| D702 | 8-719-812-32 | DIODE TLY123 | |
| D703 | 8-719-812-32 | DIODE TLY123 | |
| D704 | 8-719-812-33 | DIODE TLG123A | |
| D705 | 8-719-812-30 | DIODE TL0123 | |
| D706 | 8-719-812-33 | DIODE TLG123A | |

RESISTOR

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R701 | 1-247-817-00 | CARBON | 270 | 5% | 1/6W | |
| R702 | 1-247-817-00 | CARBON | 270 | 5% | 1/6W | |
| R703 | 1-247-811-00 | CARBON | 150 | 5% | 1/6W | |
| R704 | 1-247-811-00 | CARBON | 150 | 5% | 1/6W | |

SWITCH

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| S701 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S702 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S703 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S704 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S705 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S706 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S707 | 1-553-997-12 | SWITCH, KEY BOARD | |

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♠:A-6721-168-A TU-39 BOARD, COMPLETE (AEP,E MODEL)
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♠:A-6721-176-A TU-39 BOARD, COMPLETE (UK MODEL)
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1-230-152-00 PRESET UNIT, 12CH (UK MODEL)
1-230-134-00 PRESET UNIT, 12CH (AEP, E MODEL)
♠:3-681-175-00 LID, UPPER, SHIELD CASE, TU
♠:3-681-176-00 LID, BOTTOM, SHIELD CASE, TU
♠:3-681-183-00 CASE (MAIN), SHIELD, TU
♠:4-336-029-00 PLATE, SHIELD

CAPACITOR

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C001 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | (AEP,E MODEL) |
| C002 | 1-161-032-00 | CERAMIC | 0.01MF | 20% | 25V | (AEP,E MODEL) |
| C003 | 1-161-032-00 | CERAMIC | 0.01MF | 20% | 25V | (AEP,E MODEL) |

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C004 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | (AEP,E MODEL) |
| C005 | 1-161-075-51 | CERAMIC | 0.068MF | 20% | 50V | |
| C007 | 1-102-529-00 | CERAMIC | 100PF | 5% | 50V | |
| C008 | 1-102-527-00 | CERAMIC | 82PF | 5% | 50V | |
| C009 | 1-102-943-00 | CERAMIC | 6PF | 0.5PF | 50V | |
| C010 | 1-102-523-00 | CERAMIC | 56PF | 5% | 50V | |
| C011 | 1-102-529-00 | CERAMIC | 100PF | 5% | 50V | |
| C012 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C013 | 1-102-074-00 | CERAMIC | 0.001MF | 10% | 50V | |
| C014 | 1-102-074-00 | CERAMIC | 0.001MF | 10% | 50V | |
| C015 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C016 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V | |
| C017 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C018 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C019 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C020 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C021 | 1-123-328-00 | ELECT | 4.7MF | 20% | 25V | |
| C022 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C023 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C024 | 1-102-518-00 | CERAMIC | 33PF | 5% | 50V | |
| C025 | 1-102-529-00 | CERAMIC | 100PF | 5% | 50V | |
| C026 | 1-102-941-00 | CERAMIC | 4PF | 0.5PF | 50V | |
| C027 | 1-102-941-00 | CERAMIC | 4PF | 0.5PF | 50V | |
| C028 | 1-102-518-00 | CERAMIC | 33PF | 5% | 50V | |
| C029 | 1-102-527-00 | CERAMIC | 82PF | 5% | 50V | |
| C030 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | |
| C031 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C032 | 1-161-032-00 | CERAMIC | 0.01MF | 20% | 25V | |
| C033 | 1-123-380-00 | ELECT | 1MF | 20% | 50V | |
| C034 | 1-123-318-00 | ELECT | 33MF | 20% | 16V | |
| C035 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V | |
| C039 | 1-102-959-00 | CERAMIC | 22PF | 5% | 50V | |
| C040 | 1-102-959-00 | CERAMIC | 22PF | 5% | 50V | |
| C041 | 1-161-032-00 | CERAMIC | 0.01MF | 20% | 25V | |
| C042 | 1-161-032-00 | CERAMIC | 0.01MF | 20% | 25V | |
| C044 | 1-161-030-00 | CERAMIC | 0.0047MF | 20% | 25V | |
| C045 | 1-102-959-00 | CERAMIC | 22PF | 5% | 50V | |
| C046 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V | |
| C047 | 1-123-318-00 | ELECT | 33MF | 20% | 16V | |
| C048 | 1-161-032-00 | CERAMIC | 0.01MF | 20% | 25V | |
| C049 | 1-123-380-00 | ELECT | 1MF | 20% | 50V | |
| C050 | 1-123-356-00 | ELECT | 10MF | 20% | 50V | |
| C051 | 1-123-379-00 | ELECT | 0.47MF | 20% | 50V | |
| C052 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V | |
| C053 | 1-123-356-00 | ELECT | 10MF | 20% | 50V | (AEP,E MODEL) |
| C054 | 1-131-415-00 | ELECT(SOLID) | 0.68MF | 10% | 16V | |
| C055 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | |
| C056 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | |
| C057 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | |
| C058 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | |

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| C059 | 1-123-356-00 | ELECT | 10MF | 20% | 16V | |

DISCRIMINATOR

| Ref.No. | Part No. | Description |
|---|---|---|
| CD001 | 1-404-380-00 | DISCRIMINATOR, CERAMIC 5.5MHZ |

FILTER

| Ref.No. | Part No. | Description |
|---|---|---|
| CF001 | 1-527-263-00 | CERAMIC FILTER (5.5MHZ) |

CONNECTOR

| Ref.No. | Part No. | Description |
|---|---|---|
| CN001♠ | :1-560-892-21 | PIN, CONNECTOR 4P |
| CN002♠ | :1-560-894-00 | PIN, CONNECTOR 6P |
| CN003♠ | :1-560-895-00 | PIN, CONNECTOR 7P |
| CN004♠ | :1-560-892-00 | PIN, CONNECTOR 4P |
| CN005♠ | :1-560-893-00 | PIN, CONNECTOR 5P |
| CN006♠ | :1-560-899-11 | PIN, CONNECTOR 11P |

CAPACITOR

| Ref.No. | Part No. | Description |
|---|---|---|
| CT001 | 1-404-134-00 | TRAP, CERAMIC (5.5MHZ) |

DIODE

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| D001 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D002 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D005 | 8-719-911-19 | DIODE 1SS119 | |
| D006 | =>8-719-101-83 | DIODE RD12EL2 | (AEP,E MODEL) |
| D007 | 8-719-901-33 | DIODE 1SS133 | |
| D008 | 8-719-901-33 | DIODE 1SS133 | |
| D009 | 8-719-901-33 | DIODE 1SS133 | |
| D010 | 8-719-901-33 | DIODE 1SS133 | |
| D011 | 8-719-901-33 | DIODE 1SS133 | |
| D012 | 8-719-901-33 | DIODE 1SS133 | |
| D013 | 8-719-901-33 | DIODE 1SS133 | |
| D014 | 8-719-901-33 | DIODE 1SS133 | |
| D015 | 8-719-901-33 | DIODE 1SS133 | |
| D016 | 8-719-901-33 | DIODE 1SS133 | |
| D017 | 8-719-901-33 | DIODE 1SS133 | |
| D018 | 8-719-901-33 | DIODE 1SS133 | |
| D019 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D020 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D021 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D022 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D023 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D024 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D025 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D026 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D027 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D028 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D029 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D030 | 8-719-911-19 | DIODE 1SS119 | (AEP,E MODEL) |
| D032 | 8-719-911-19 | DIODE 1SS119 | |
| D033 | 8-719-911-19 | DIODE 1SS119 | |
| D034 | 8-719-911-19 | DIODE 1SS119 | |
| D035 | 8-719-911-19 | DIODE 1SS119 | |

When indicating parts by reference number, please include the board name.

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| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| D036 | 8-719-911-19 | DIODE 1SS119 | |
| D037 | 8-719-911-19 | DIODE 1SS119 | |
| D038 | 8-719-911-19 | DIODE 1SS119 | |
| D039 | 8-719-911-19 | DIODE 1SS119 | |
| D040 | 8-719-911-19 | DIODE 1SS119 | |
| D041 | 8-719-911-19 | DIODE 1SS119 | |
| D042 | 8-719-911-19 | DIODE 1SS119 | |
| D043 | 8-719-911-19 | DIODE 1SS119 | |

### IC

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| IC001 | 8-759-276-07 | IC TA7607AP | |
| IC002 | 8-759-193-91 | IC UPC1391H | |
| IC003 | 8-759-600-44 | IC M54836AP | |
| IC004 | 8-759-157-40 | IC UPC574J | |

### COIL

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| L001 | 1-407-681-00 | MICRO INDUCTOR 1UH | |
| L002 | 1-407-690-00 | MICRO INDUCTOR 5.6UH | |
| L003 | 1-408-406-00 | MICRO INDUCTOR 5.6UH | |
| L004 | 1-408-423-00 | MICRO INDUCTOR 150UH | |
| L005 | 1-408-409-00 | MICRO INDUCTOR 10UH | |
| L007 | 1-408-412-00 | MICRO INDUCTOR 18UH | |
| L008 | 1-408-413-00 | MICRO INDUCTOR 22UH | |

### TRANSISTOR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| Q001 | 8-765-300-00 | TRANSISTOR 2SC2009 | |
| Q002 | 8-769-200-20 | TRANSISTOR 2SK107-2 | |
| Q003 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q007 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q008 | =>8-729-988-12 | TRANSISTOR 2SA881 | |
| Q009 | =>8-729-117-54 | TRANSISTOR 2SA1175 | (AEP,E MODEL) |
| Q010 | =>8-729-117-54 | TRANSISTOR 2SA1175 | (AEP,E MODEL) |
| Q011 | =>8-729-117-54 | TRANSISTOR 2SA1175 | (AEP,E MODEL) |
| Q013 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q014 | =>8-769-200-20 | TRANSISTOR 2SK107-2 | (AEP,E MODEL) |
| Q016 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q017 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q018 | =>8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q019 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR | |

### RESISTOR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| R001 | 1-247-871-00 | CARBON 47K 5% 1/6W | |
| R002 | 1-247-847-00 | CARBON 4.7K 5% 1/6W | |
| R003 | 1-247-831-00 | CARBON 1K 5% 1/6W | |
| R004 | 1-247-847-00 | CARBON 4.7K 5% 1/6W | |
| R005 | 1-247-845-00 | CARBON 3.9K 5% 1/6W | |
| R006 | 1-247-815-00 | CARBON 220 5% 1/6W | |
| R007 | 1-247-815-00 | CARBON 220 5% 1/6W | |
| R008 | 1-247-823-00 | CARBON 470 5% 1/6W | |
| R009 | 1-247-837-00 | CARBON 1.8K 5% 1/6W | |
| R010 | 1-247-831-00 | CARBON 1K 5% 1/6W | |
| R011 | 1-247-841-00 | CARBON 2.7K 5% 1/6W | |
| R012 | 1-247-835-00 | CARBON 1.5K 5% 1/6W | |
| R013 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R014 | 1-247-877-00 | CARBON 82K 5% 1/6W | |
| R015 | 1-247-867-00 | CARBON 33K 5% 1/6W | |
| R016 | 1-247-901-00 | CARBON 820K 5% 1/6W | |
| R017 | 1-247-831-00 | CARBON 1K 5% 1/6W | |
| R018 | 1-247-813-00 | CARBON 180 5% 1/6W | |
| R019 | 1-247-807-00 | CARBON 100 5% 1/6W | |
| R020 | 1-247-823-00 | CARBON 470 5% 1/6W | |
| R021 | 1-247-820-00 | CARBON 360 5% 1/6W | |
| R028 | 1-247-831-00 | CARBON 1K 5% 1/6W | |
| R029 | 1-247-831-00 | CARBON 1K 5% 1/6W | |
| R030 | 1-247-847-00 | CARBON 4.7K 5% 1/6W | |
| R031 | 1-247-817-00 | CARBON 270 5% 1/6W | |
| R032 | 1-247-821-00 | CARBON 390 5% 1/6W | |
| R035 | 1-247-841-00 | CARBON 2.7K 5% 1/6W | |
| R036 | 1-247-865-00 | CARBON 27K 5% 1/6W | (AEP,E MODEL) |
| R039 | 1-247-879-00 | CARBON 100K 5% 1/6W | (AEP,E MODEL) |
| R040 | 1-247-855-00 | CARBON 10K 5% 1/6W | (AEP,E MODEL) |
| R041 | 1-247-855-00 | CARBON 10K 5% 1/6W | (AEP,E MODEL) |
| R042 | 1-247-855-00 | CARBON 10K 5% 1/6W | (AEP,E MODEL) |
| R043 | 1-247-855-00 | CARBON 10K 5% 1/6W | (AEP,E MODEL) |
| R044 | 1-247-855-00 | CARBON 10K 5% 1/6W | (AEP,E MODEL) |
| R045 | 1-247-855-00 | CARBON 10K 5% 1/6W | (AEP,E MODEL) |
| R049 | 1-247-855-00 | CARBON 10K 5% 1/6W | |
| R050 | 1-247-895-00 | CARBON 470K 5% 1/6W | (AEP,E MODEL) |
| R052 | 1-247-897-00 | CARBON 560K 5% 1/6W | |
| R053 | 1-247-883-00 | CARBON 150K 5% 1/6W | |
| R054 | 1-247-883-00 | CARBON 150K 5% 1/6W | |
| R055 | 1-247-867-00 | CARBON 33K 5% 1/6W | |
| R056 | 1-247-871-00 | CARBON 47K 5% 1/6W | |
| R057 | 1-247-871-00 | CARBON 47K 5% 1/6W | |
| R058 | 1-247-895-00 | CARBON 470K 5% 1/6W | |
| R059 ⚠ | 1-206-670-00 | METAL OXIDE 1.8K 5% 2W | F |
| R060 | 1-247-875-00 | CARBON 68K 5% 1/6W | |
| R061 | 1-247-839-00 | CARBON 2.2K 5% 1/6W | |
| R062 | 1-247-831-00 | CARBON 1K 5% 1/6W | |
| R063 | 1-247-881-00 | CARBON 120K 5% 1/6W | |
| R064 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R065 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R066 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R067 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R068 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R069 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R070 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R071 | 1-247-855-00 | CARBON 10K 5% 1/6W | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| R072 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R073 ⚠ | 1-212-849-00 | FUSIBLE 4.7 5% 1/4W | F |
| R074 | 1-247-871-00 | CARBON 47K 5% 1/6W | |
| R076 | 1-247-863-00 | CARBON 22K 5% 1/6W | |
| R077 | 1-247-871-00 | CARBON 47K 5% 1/6W | |
| R078 | 1-247-875-00 | CARBON 68K 5% 1/6W | |
| R079 | 1-247-879-00 | CARBON 100K 5% 1/6W | |
| R080 | 1-247-895-00 | CARBON 470K 5% 1/6W | |
| R081 | 1-247-855-00 | CARBON 10K 5% 1/6W | |
| R082 | 1-247-839-00 | CARBON 2.2K 5% 1/6W | |

### VARIABLE RESISTOR

| Ref.No. | Part No. | Description |
|---|---|---|
| RV001 | 1-228-747-00 | RES, ADJ, CARBON 4.7K |
| RV002 | 1-228-753-00 | RES, ADJ, CARBON 470K |

### SWITCH

| Ref.No. | Part No. | Description |
|---|---|---|
| S001 | 1-516-226-00 | SLIDE SWITCH |
| S002 | 1-554-373-00 | SWITCH, LEVER |

### FILTER

| Ref.No. | Part No. | Description |
|---|---|---|
| SF001 | 1-404-433-00 | SAWF |

### TRANSFORMER

| Ref.No. | Part No. | Description |
|---|---|---|
| T001 | 1-404-068-00 | COIL, VIF |
| T002 | 1-404-068-00 | COIL, VIF |
| T003 | 1-404-207-00 | COIL, VIF |
| T004 | 1-404-203-00 | COIL, VIF |
| T005 | 1-404-203-00 | COIL, VIF |

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♠:1-610-400-00 MT-4 BOARD
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⚠ 1-463-350-00 TUNER (BT-881) (AEP,E MODEL)
⚠ 1-463-371-00 TUNER (BT-882) (UK MODEL)

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♠:1-610-410-00 SW-25 BOARD
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### VARIABLE RESISTOR

| Ref.No. | Part No. | Description |
|---|---|---|
| RV611 | 1-230-122-00 | RES, VAR, CARBON 100K |

### SWITCH

| Ref.No. | Part No. | Description |
|---|---|---|
| S611 | 1-554-377-00 | SWITCH, SLIDE |
| S612 | 1-554-377-00 | SWITCH, SLIDE |

♠:1-609-227-00 CS-3 BOARD
**********

### CONNECTOR

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| CN301 | ♠:1-564-029-00 | PIN, CONNECTOR 4P | |

### SWITCH

| Ref.No. | Part No. | Description |
|---|---|---|
| S301 | 1-554-241-00 | SWITCH, LEVER |

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♠:1-609-228-00 CS-4 BOARD
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### SWITCH

| Ref.No. | Part No. | Description |
|---|---|---|
| S302 | 1-554-241-00 | SWITCH, LEVER |

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♠:1-606-794-00 N BOARD
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### CAPACITOR

| Ref.No. | Part No. | Description | | | |
|---|---|---|---|---|---|
| C001 | 1-123-617-00 | ELECT | 10MF | 20% | 16V |
| C002 | 1-123-617-00 | ELECT | 10MF | 20% | 16V |
| C003 | 1-123-617-00 | ELECT | 10MF | 20% | 16V |
| C004 | 1-161-019-00 | CERAMIC | 0.033MF | 10% | 25V |
| C005 | 1-108-567-00 | MYLAR | 0.0033MF | 5% | 50V |
| C006 | 1-123-821-00 | ELECT | 47MF | 20% | 16V |

### COMPOSITION CIRCUIT BLOCK

| Ref.No. | Part No. | Description |
|---|---|---|
| CP001 | 1-232-234-00 | COMPOSITION CIRCUIT BLOCK |

### DIODE

| Ref.No. | Part No. | Description |
|---|---|---|
| D001 | 8-719-110-32 | DIODE PH302B |

### IC

| Ref.No. | Part No. | Description |
|---|---|---|
| IC001 | 8-759-113-73 | IC UPC1373H |

### COIL

| Ref.No. | Part No. | Description |
|---|---|---|
| L001 | 1-404-310-00 | COIL |

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♠:1-605-071-21 LM-8 BOARD
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### CAPACITOR

| Ref.No. | Part No. | Description | | | |
|---|---|---|---|---|---|
| C101 | 1-161-057-00 | CERAMIC | 0.033MF | 10% | 50V |
| C102 | 1-161-057-00 | CERAMIC | 0.033MF | 10% | 50V |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

### COIL

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| L101 | 1-408-120-00 | MICRO INDUCTOR 18UH | | | | |
| L102 | 1-408-120-00 | MICRO INDUCTOR 18UH | | | | |

### RESISTOR

| | | | | | | |
|---|---|---|---|---|---|---|
| R101 | 1-206-479-00 | METAL OXIDE | 47 | 5% | 2W | F |

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♠:1-610-401-00 RD-6 BOARD
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♠:3-681-157-00 HOLDER, RD

### DIODE

| | | |
|---|---|---|
| D001 | 8-719-921-03 | DIODE GP-2S02B |

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♠:1-610-402-00 RD-7 BOARD
**********

### DIODE

| | | |
|---|---|---|
| D001 | 8-719-921-03 | DIODE GP-2S02B |

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♠:1-610-409-00 PS-23 BOARD
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1-533-162-00 HOLDER, FUSE

### CAPACITOR

(AEP MODEL ONLY)

| | | | | | |
|---|---|---|---|---|---|
| C401 ⚠ | 1-130-710-00 | FILM | 0.1MF | 20% | 250V |
| C402 ⚠ | 1-161-742-00 | CERAMIC | 0.0022MF | 20% | 400V |
| C403 ⚠ | 1-161-742-00 | CERAMIC | 0.0022MF | 20% | 400V |
| C404 ⚠ | 1-161-742-00 | CERAMIC | 0.0022MF | 20% | 400V |
| C405 ⚠ | 1-161-742-00 | CERAMIC | 0.0022MF | 20% | 400V |
| C406 | 1-125-298-00 | ELECT(BLOCK) | 10000MF | 20% | 25V |
| C414 | 1-123-332-00 | ELECT | 47MF | 20% | 16V |
| C415 | 1-123-332-00 | ELECT | 47MF | 20% | 16V |

### CONNECTOR

| | | |
|---|---|---|
| CN403 | 1-560-891-00 | PIN, CONNECTOR 3P |
| CN405 | 1-560-890-00 | PIN, CONNECTOR 2P |
| CN407 | 1-560-890-21 | PIN, CONNECTOR 2P |

### DIODE

| | | |
|---|---|---|
| D401 | 8-719-505-20 | DIODE S5VB20 |

### FUSE

| | | | | |
|---|---|---|---|---|
| F401 ⚠ | 1-532-203-00 | FUSE, TIME-LAG | T2A | 250V |
| F402 ⚠ | 1-532-237-00 | FUSE, TIME-LAG | T3.15A | 250V |

### IC

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| IC401 | 8-749-912-29 | IC STR1229 | | | | |

### RESISTOR

| | | | | | |
|---|---|---|---|---|---|
| R411 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W |

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♠:A-6728-737-A PS-22 BOARD, COMPLETE
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1-533-162-00 HOLDER, FUSE

### CAPACITOR

| | | | | | |
|---|---|---|---|---|---|
| C308 | 1-123-325-00 | ELECT | 2200MF | 20% | 16V |
| C309 | 1-123-377-00 | ELECT | 470MF | 20% | 63V |
| C311 | 1-123-375-00 | ELECT | 220MF | 20% | 63V |
| C316 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C319 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C320 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |

### CONNECTOR

| | | |
|---|---|---|
| CN301 | 1-560-893-00 | PIN, CONNECTOR 5P |
| CN302 | 1-560-892-21 | PIN, CONNECTOR 4P |
| CN304 | 1-560-895-00 | PIN, CONNECTOR 7P |
| CN306 | 1-560-891-31 | PIN, CONNECTOR 3P |
| CN308 | 1-560-894-00 | PIN, CONNECTOR 6P |

### DIODE

| | | |
|---|---|---|
| D302 | =>8-719-511-20 | DIODE S1UB20 |
| D313 | 8-719-200-02 | DIODE 10E-2 |
| D315 | 8-719-200-02 | DIODE 10E-2 |
| D317 | 8-719-100-41 | DIODE RD6.8EB2 |
| D318 | 8-719-100-44 | DIODE RD7.5EB2 |

### FUSE

| | | | | |
|---|---|---|---|---|
| F304 ⚠ | .1-532-279-00 | FUSE, TIME-LAG | T500mA | 250V |
| F306 ⚠ | .1-532-279-00 | FUSE, TIME-LAG | T500mA | 250V |

### TRANSISTOR

| | | |
|---|---|---|
| Q301 | =>8-729-316-16 | TRANSISTOR 2SC1061 |
| Q302 | 8-729-178-54 | TRANSISTOR 2SC2785 |
| Q303 | 8-729-178-54 | TRANSISTOR 2SC2785 |
| Q306 | 8-729-178-54 | TRANSISTOR 2SC2785 |
| Q307 | =>8-729-316-16 | TRANSISTOR 2SC1061 |
| Q308 | =>8-729-316-16 | TRANSISTOR 2SC1061 |
| Q309 | 8-729-178-54 | TRANSISTOR 2SC2785 |

### RESISTOR

| | | | | | |
|---|---|---|---|---|---|
| R301 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W |
| R302 | 1-247-842-00 | CARBON | 3K | 5% | 1/6W |
| R303 | 1-247-862-00 | CARBON | 20K | 5% | 1/6W |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R304 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R305 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R306 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R308 ⚠ | 1-213-144-00 | METAL OXIDE | 1.2K | 5% | 1W | F |
| R310 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R313 | 1-244-885-00 | CARBON | 3.3K | 5% | 1/2W | |
| R314 | 1-247-865-00 | CARBON | 27K | 5% | 1/2W | |
| R315 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R316 | 1-247-852-00 | CARBON | 7.5K | 5% | 1/6W | |
| R317 | 1-212-857-00 | FUSIBLE | 10 | 5% | 1/4W | F |
| R318 | 1-212-857-00 | FUSIBLE | 10 | 5% | 1/4W | F |

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♠:1-610-403-12 TM-37 BOARD
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### CAPACITOR

| Ref.No. | Part No. | Description | | | |
|---|---|---|---|---|---|
| C001 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C002 | 1-125-299-00 | ************ | 0.047F | | 0 |
| C004 | 1-102-959-00 | CERAMIC | 22PF | 5% | 50V |
| C005 | 1-123-318-00 | ELECT | 33MF | 20% | 16V |
| C006 | 1-123-342-00 | ELECT | 22MF | 20% | 35V |
| C007 | 1-161-024-00 | CERAMIC | 0.082MF | 10% | 25V |
| C008 | 1-161-772-11 | CERAMIC | 0.1MF | 10% | 25V |
| C009 | 1-161-061-00 | CERAMIC | 0.068MF | 10% | 50V |
| C011 | 1-161-772-11 | CERAMIC | 0.1MF | 10% | 25V |

### CONNECTOR

| Ref.No. | Part No. | Description |
|---|---|---|
| CN002 | ♠:1-560-891-00 | PIN, CONNECTOR 3P |
| CN004 | ♠:1-560-895-00 | PIN, CONNECTOR 7P |
| CN007 | ♠:1-564-027-00 | PIN, CONNECTOR 2P |

### DIODE

| Ref.No. | Part No. | Description |
|---|---|---|
| D001 | 8-719-911-19 | DIODE 1SS119 |
| D002 | 8-719-191-07 | DIODE RD9.1E-B |
| D005 | 8-719-812-31 | DIODE TLR123 |
| D006 | 8-719-911-19 | DIODE 1SS119 |
| D007 | 8-719-911-19 | DIODE 1SS119 |
| D008 | 8-719-911-19 | DIODE 1SS119 |
| D009 | 8-719-911-19 | DIODE 1SS119 |

### IC

| Ref.No. | Part No. | Description |
|---|---|---|
| IC001 | 8-759-101-63 | UPD7519G-033 |

### TRANSISTOR

| Ref.No. | Part No. | Description |
|---|---|---|
| Q005 | =>8-729-245-83 | TRANSISTOR 2SC2458 |
| Q006 | =>8-729-245-83 | TRANSISTOR 2SC2458 |
| Q007 | =>8-729-204-83 | TRANSISTOR 2SA1048-GR |

### RESISTOR

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R001 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R004 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R006 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R007 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R008 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R009 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R010 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R011 | 1-247-872-00 | CARBON | 51K | 5% | 1/6W | |
| R012 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R013 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R014 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R015 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R016 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R017 | 1-247-868-00 | CARBON | 36K | 5% | 1/6W | |
| R018 | 1-247-886-00 | CARBON | 200K | 5% | 1/6W | |
| R019 | 1-247-874-00 | CARBON | 62K | 5% | 1/6W | |
| R020 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R021 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R022 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R023 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R024 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R025 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R026 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R027 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R028 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R029 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R030 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |
| R032 | 1-247-855-00 | CARBON | 10K | 5% | 1/6W | |

### TRIMMER

| Ref.No. | Part No. | Description |
|---|---|---|
| TC001 | 1-141-022-11 | CAP, TRIMMER, CERAMIC |

### CRYSTAL

| Ref.No. | Part No. | Description |
|---|---|---|
| X001 | 1-527-647-00 | OSCILLATOR, CRYSTAL |

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♠:1-610-404-12 TM-38 BOARD
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♠:2-364-740-00 HOLDER, LED

### DIODE

| Ref.No. | Part No. | Description |
|---|---|---|
| D101 | 8-719-911-19 | DIODE 1SS119 |
| D102 | 8-719-812-31 | DIODE TLR123 |
| D103 | 8-719-812-31 | DIODE TLR123 |

### INDICATOR TUBE

| Ref.No. | Part No. | Description |
|---|---|---|
| FL101 | 1-519-295-00 | INDICATOR TUBE, FLUORESCENT |

### RESISTOR

| Ref.No. | Part No. | Description | | | |
|---|---|---|---|---|---|
| R101 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

# TM-38 TM-39 CH-36

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| | | SWITCH | |
| S101 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S102 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S103 | 1-553-997-12 | SWITCH, KEY BOARD | |

* * *

♠:1-610-405-12 TM-39 BOARD

### SWITCH

| | | | |
|---|---|---|---|
| S203 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S204 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S205 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S206 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S207 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S208 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S209 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S210 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S211 | 1-553-997-12 | SWITCH, KEY BOARD | |

* * *

♠:1-610-407-00 CH-36 BOARD

### SWITCH

| | | | |
|---|---|---|---|
| S501 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S502 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S503 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S504 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S505 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S506 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S507 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S508 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S509 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S510 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S511 | 1-553-997-12 | SWITCH, KEY BOARD | |
| S512 | 1-553-997-12 | SWITCH, KEY BOARD | |

* * *

### MISCELLANEOUS

| | | | |
|---|---|---|---|
| | ⚠1-463-350-00 | TUNER (BT-881) (AEP,E MODEL) | |
| | ⚠1-463-371-00 | TUNER (BT-882) (UK MODEL) | |
| | ⚠1-464-270-00 | BOOSTER, RF MODULATOR(RFU-808) (AEP,E MODEL) | |
| | ⚠1-464-274-00 | BOOSTER, RF MODULATOR(RFU-808)(UK MODEL) | |
| | ⚠1-534-817-XX | CORD, POWER (AEP,E MODEL) | |
| | ⚠1-551-884-00 | CORD, POWER (UK MODEL) | |
| | A-6761-060-A | ACE ASSY (AUDIO, AUDIO ERASE, CTL) | |
| | ♠:1-556-934-00 | CABLE, PIN | |
| | 8-825-508-10 | HEAD, FE | |

| Ref.No. | Part No. | Description | Remark |
|---|---|---|---|
| L901 | 1-464-249-21 | SENSOR, S COIL | |
| L902 | 1-464-250-00 | SENSOR, T COIL | |
| M902 | 8-838-048-00 | MOTOR, DC (BHF-1908A)(CAPSTAN MOTOR) | |
| M903 | A-4910-021-A | R STATOR BOARD, COMPLETE (REEL MOTOR) | |
| M904 | A-6737-118-A | MOTOR ASSY, L (LOADING MOTOR) | |
| | 1-541-163-31 | MOTOR | |
| PM901 | 1-454-348-31 | SOLENOID, BRAKE PLUNGER | |
| PM902 | 1-454-349-00 | SOLENOID, PLUNGER | |
| S901 | 1-554-374-00 | SWITCH, LEVER (REC PROOF) | |
| S902 | 1-554-374-00 | SWITCH, LEVER (CASSETTE IN) | |
| S903 | 1-553-539-00 | SWITCH, MICRO (LOADING END) | |
| S904 | 1-553-718-00 | SWITCH, MICRO (UNLOADING END) | |
| S905 ⚠ | 1-552-304-00 | SWITCH, VOLTAGE SELECTOR (E MODEL) | |
| T901 ⚠ | 1-447-614-00 | TRANSFORMER, POWER (AEP,UK MODEL) | |
| T901 ⚠ | 1-447-665-00 | TRANSFORMER, POWER (E MODEL) | |

* * *

### ACCESSORIES AND PACKING MATERIALS

| Part No. | Description | Remark |
|---|---|---|
| A-6765-177-A | COMMANDER ASSY RMT-216S(AEP MODEL/SILVER) (E MODEL) | |
| A-6765-199-A | COMMANDER ASSY RMT-216G(AEP MODEL/GRAY) (UK MODEL) | |
| A-6765-286-A | COMMANDER ASSY RMT-216R (AEP MODEL/RED) | |
| A-6765-287-A | COMMANDER ASSY RMT-216W (AEP MODEL/WHITE) | |
| 1-551-513-00 | CABLE, COAXAL ASSY | |
| 1-556-893-00 | CORD ASSY, COAXIAL | |
| 3-660-986-00 | SHEET, PROTECTION | |
| 3-671-873-00 | CASE, ACCESSORY | |
| 3-675-581-00 | LID, CASE, ACCESSORY | |
| 3-681-187-00 | INDIVIDUAL CARTON (AEP MODEL/GRAY) | |
| 3-681-188-00 | INDIVIDUAL CARTON (AEP MODEL/SILVER) | |
| 3-681-194-00 | INDIVIDUAL CARTON (UK MODEL) | |
| 3-681-210-00 | INDIVIDUAL CARTON (E MODEL) | |
| 3-681-240-00 | INDIVIDUAL CARTON (AEP MODEL/RED) | |
| 3-681-241-00 | INDIVIDUAL CARTON (AEP MODEL/WHITE) | |
| 3-681-190-00 | SHEET (LARGE), PROTECTION | |
| 3-681-192-00 | CUSHION (UPPER) | |
| 3-681-193-00 | CUSHION (LOWER) | |
| 3-701-007-00 | BAND, BINDING | |
| 3-773-433-11 | MANUAL, INSTRUCTION (AEP MODEL) ENGLISH, FRENCH, GERMAN, DUTCH | |
| 3-773-433-41 | MANUAL, INSTRUCTION (AEP MODEL) SPANISH, ITARIAN, SWEDISH | |
| 3-773-433-51 | MANUAL, INSTRUCTION (UK MODEL) ENGLISH | |
| 3-773-433-71 | MANUAL, INSTRUCTION (E MODEL) ENGLISH | |
| 3-656-301-00 | SCREWDRIVER | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

# RMT-216

# SERVICE MANUAL

July, 1983

---

## SPECIFICATIONS

| | |
|---|---|
| Remote control system | Infrared control |
| Power requirements | 3V dc, 2 IEC designation R6 batteries (size AA) |
| Dimensions | Approx. 65 × 20 × 153 mm (w/h/d)<br>($2^{5}/_{8}$ × $^{13}/_{16}$ × $6^{1}/_{8}$ inches)<br>incl. projecting parts and controls |
| Weight | Approx. 140 g (5 oz)<br>incl. batteries |

## REMOTE CONTROL UNIT

SONY®

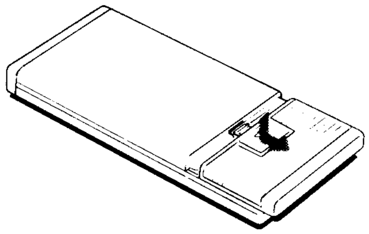
ACC

## 1. REMOTE CONTROL OPERATION

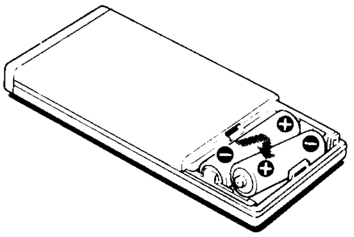
You can control almost all the functions of the this video cassette recorder from your armchair using the supplied remote control unit.

### BATTERY INSERTION

1 Open the lid.



2 Insert two IEC designation R6 batteries (size AA) with correct polarity.



3 Close the lid firmly.

**Notes on the remote control unit**

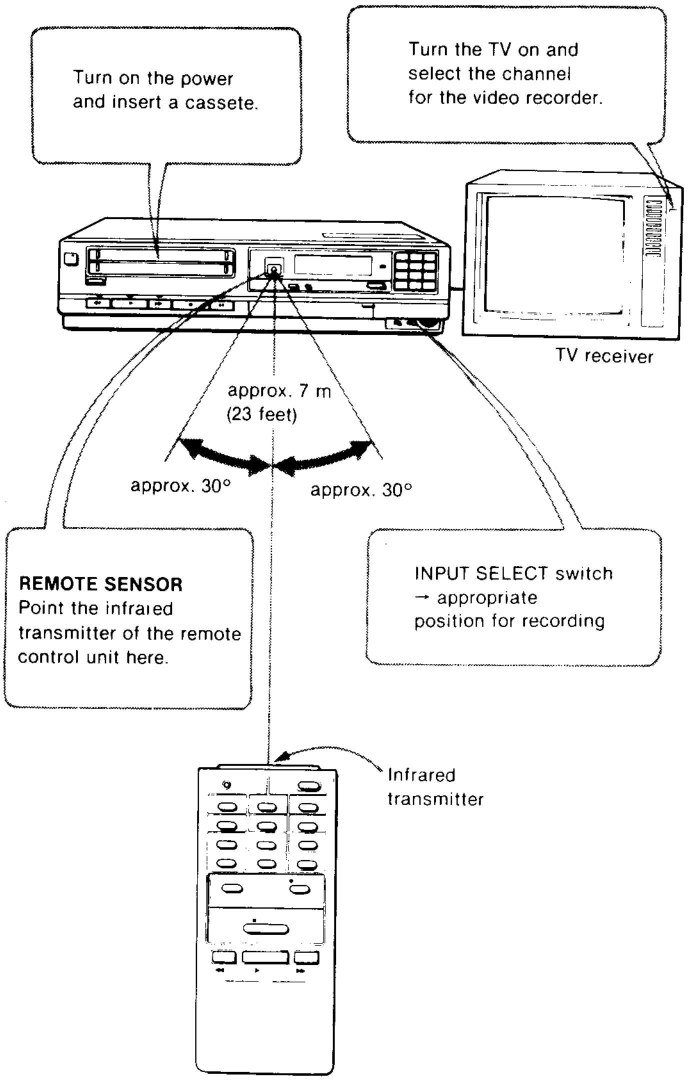
- Avoid dropping foreign objects into the cabinet, particularly when replacing batteries.
- Keep the unit away from extremely hot or humid places.
- Avoid mechanical shock to the unit.
- This remote control unit may be used only with this video cassette recorder.

**Battery life**

In normal operation, batteries will last for about six months. If the range of the remote control unit becomes noticeably short, replace the batteries with new ones. When the batteries are exhausted, the remote function indicator will not light when the buttons on the control unit are pressed.

**If the remote control unit is not to be used for a long period of time,** remove the batteries to avoid possible damage from battery leakage.

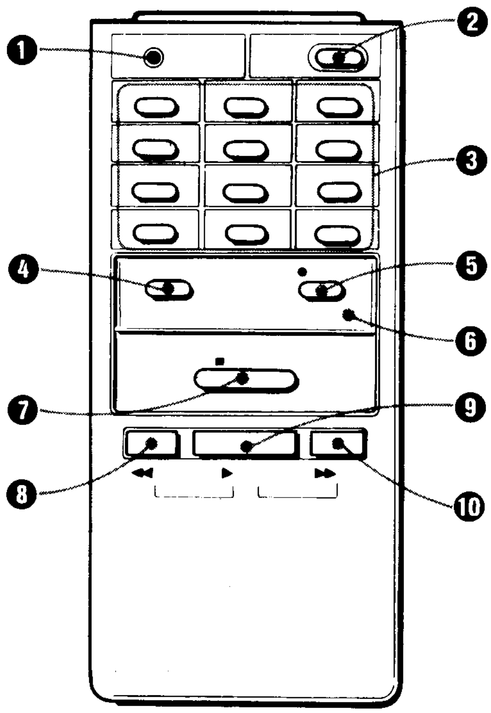
### PREPARATION


Turn on the power and insert a cassete.
Turn the TV on and select the channel for the video recorder.
TV receiver
approx. 7 m (23 feet)
approx. 30°
approx. 30°
REMOTE SENSOR
Point the infraıed transmitter of the remote control unit here.
INPUT SELECT switch → appropriate position for recording
Infrared transmitter

**Notes**

- There should be no obstacles between the remote control unit and the remote control detector of the recorder.
- The shorter the distance between the remote control unit and the recorder, the wider the angle within which the recorder can be controlled.

## FUNCTION OF THE BUTTONS



**❶ Remote function indicator**
Lights up when any of the buttons on the remote control unit are pressed.

**❷ ON button**
Press to turn the power on. To turn it off, press again.

**❸ Programme select buttons**
Press to select a programme to be viewed or to be recorded.

**❹ II PAUSE button**
Press to stop the tape momentarily. To resume the previous mode, press it again.

**❺ ● REC button**
Press to start recording.

**❻ Sliding cover**
During playback, slide this cover over the record button to prevent accidental recording. During recording, slide this cover down to prevent accidental interruption of recording.

**❼ ■ STOP button**
Press to stop the tape.

**❽ ◀◀ REW button**
Press to rewind the tape. Used also for reverse picture search operation during playback and for skip scan operation during rewinding.

**❾ ▶ PLAY button**
Press to play the tape back.

**❿ ▶▶ FF button**
Press to advance the tape rapidly. Used also for forward picture search operation during playback and for skip scan operation during fast forward mode.

## OPERATION

### Recording

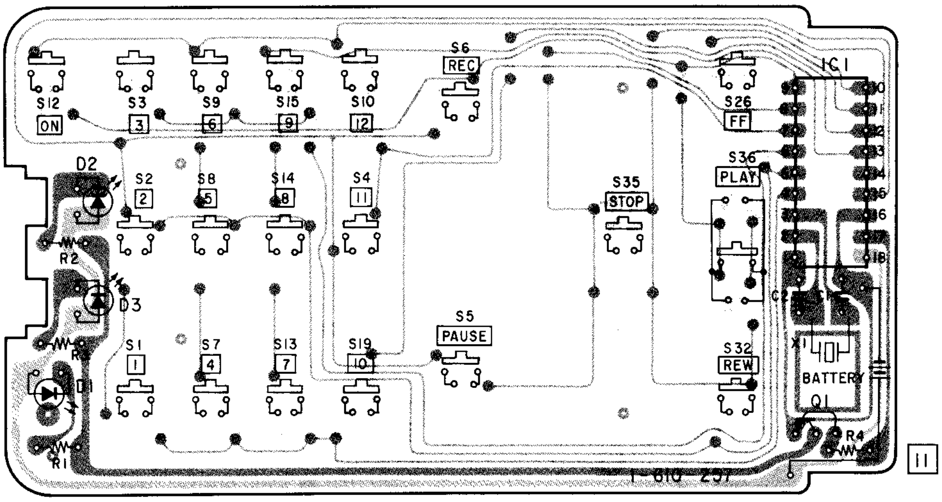
1 Select the channel to be recorded with the programme select button.
2 Press the ● REC button. The recording will begin.
To stop recording, press the ■ STOP button.

### Playback

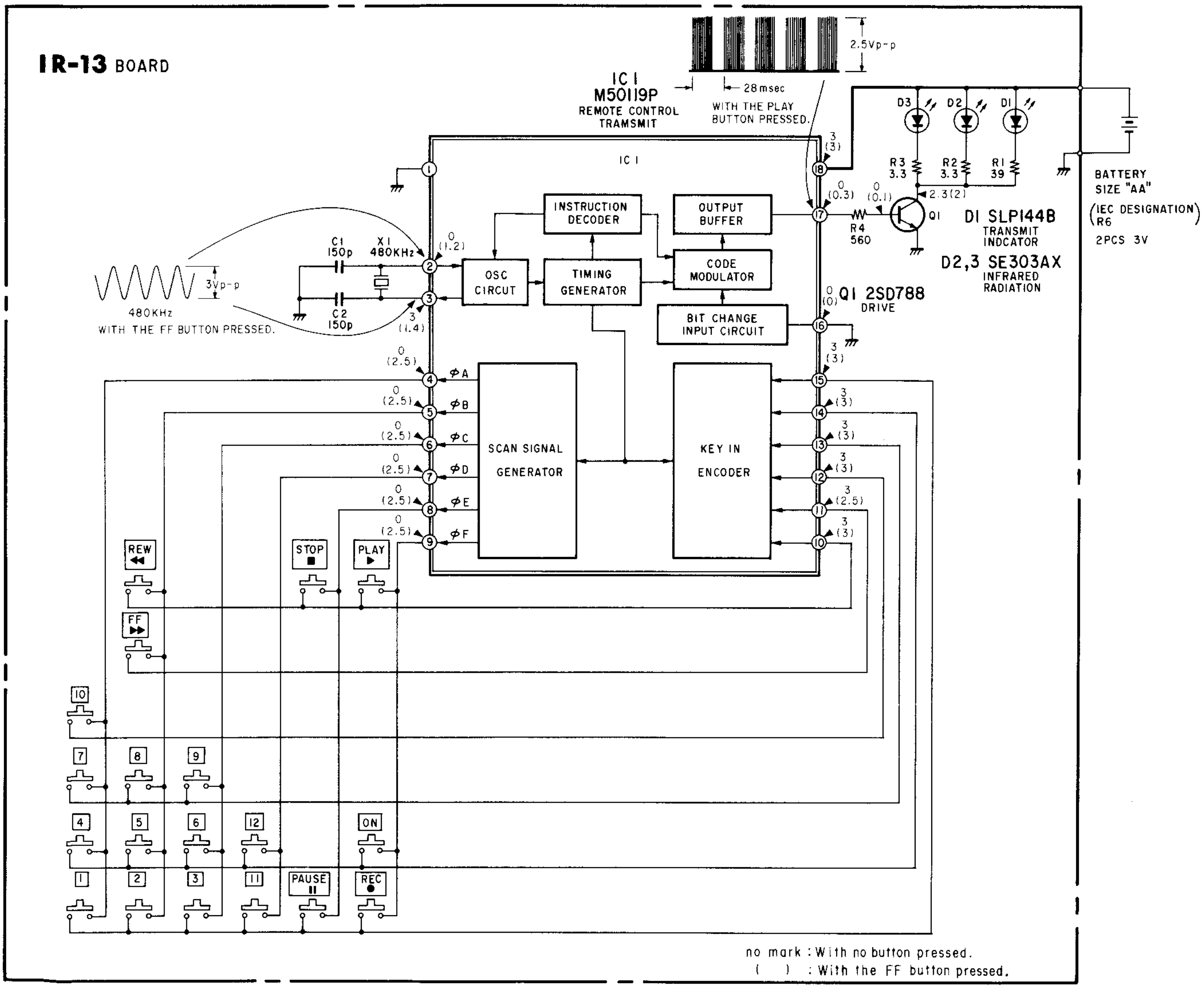
Press the ▶ PLAY button. Playback will begin.
To stop playback, press the ■ STOP button.

## 2. PRINTED WIRING BOARD

**[IR-13 BOARD]**


S6
REC
S12
ON
S3
3
S9
6
S15
9
S10
12
IC1
S26
FF
S36
PLAY
D2
S2
2
S8
5
S14
8
S4
11
S35
STOP
R2
D3
R3
S1
1
S7
4
S13
7
S19
10
S5
PAUSE
S32
REW
D1
C2
C1
X1
BATTERY
Q1
R4
R1
1-610-257
11

## 3. SCHEMATIC DIAGRAM


IR-13 BOARD
IC1
M50119P
REMOTE CONTROL
TRAMSMIT
28msec
WITH THE PLAY
BUTTON PRESSED.
2.5Vp-p
IC1
INSTRUCTION
DECODER
OUTPUT
BUFFER
OSC
CIRCUT
TIMING
GENERATOR
CODE
MODULATOR
BIT CHANGE
INPUT CIRCUIT
SCAN SIGNAL
GENERATOR
KEY IN
ENCODER
φA
φB
φC
φD
φE
φF
C1
150p
X1
480KHz
C2
150p
3Vp-p
480KHz
WITH THE FF BUTTON PRESSED.
D3
D2
D1
R3
3.3
R2
3.3
R1
39
R4
560
Q1
2.3(2)
D1 SLP144B
TRANSMIT
INDCATOR
D2,3 SE303AX
INFRARED
RADIATION
Q1 2SD788
DRIVE
BATTERY
SIZE "AA"
(IEC DESIGNATION R6)
2PCS 3V
REW
FF
STOP
PLAY
10
7
8
9
4
5
6
12
ON
1
2
3
11
PAUSE
REC

no mark : With no button pressed.
( ) : With the FF button pressed.

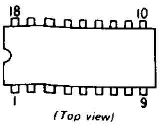
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- —— : B + bus.

The voltage value is measured using a digital tester (10MΩ/V).

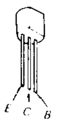
When indicating parts by reference number, please include the board name.

- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- ▓ Conductor side (inner)
- [illegible]
- ▒ B + pattern

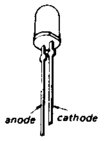
**M50119P**



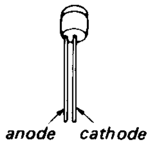
**2SD788**



**SE303AX**

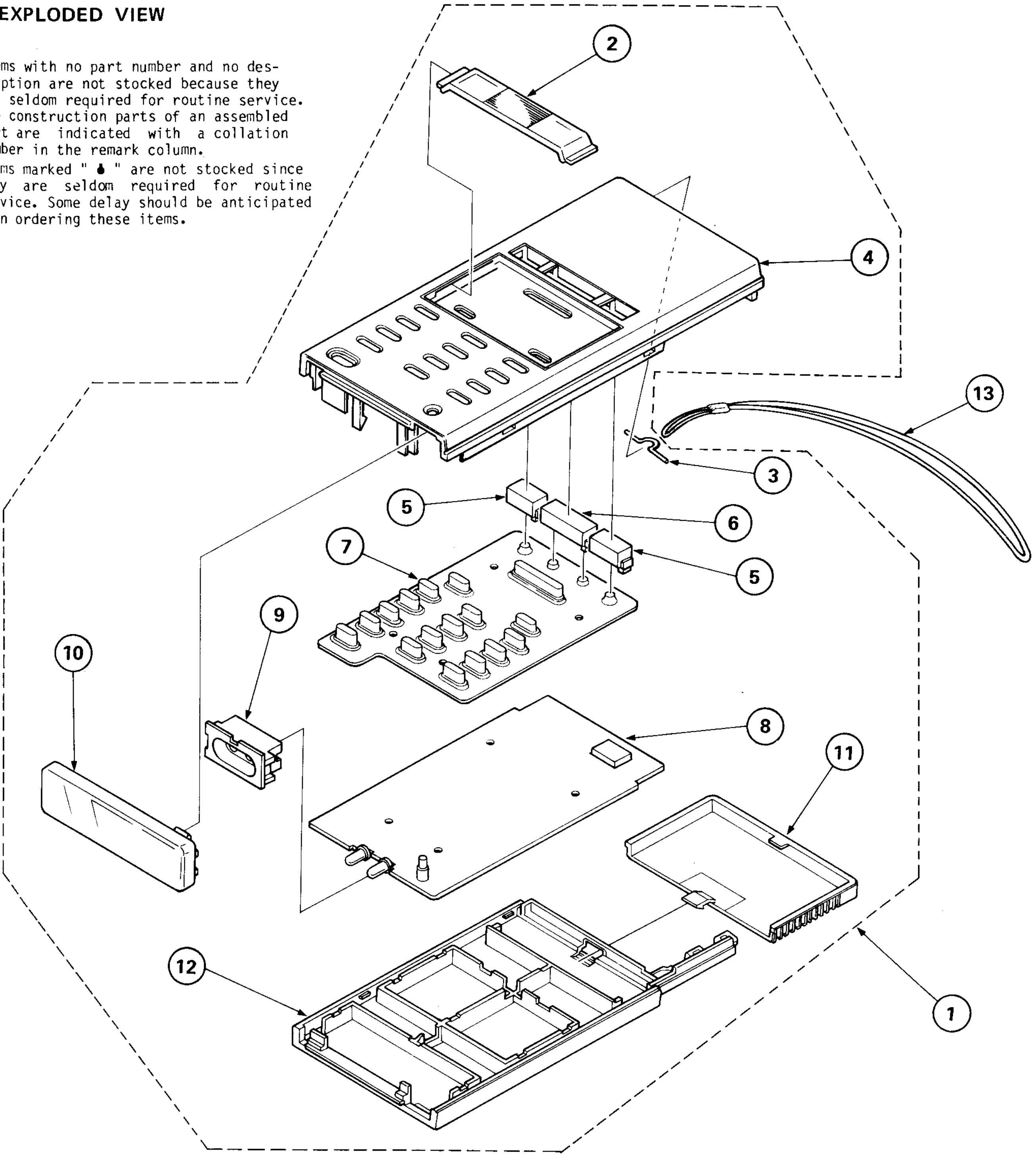


**SLP144B**



## 4. EXPLODED VIEW

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " ♠ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.



| No. | Part No. | Description | Remark |
|---|---|---|---|
| 1 | A-6765-177-A | COMMANDER ASSY(AEP MODEL/SILVER)(E MODEL) | 2,3,4,5,6,7,8,9,10,11,12 |
|  | A-6765-199-A | COMMANDER ASSY (AEP MODEL/GRAY)(UK MODEL) |  |
|  | **A-6765-286-A** | **COMMANDER ASSY (AEP MODEL/RED)** |  |
|  | **A-6765-287-A** | **COMMANDER ASSY (AEP MODEL/WHITE)** |  |
| 2 | 2-290-603-00 | CURSOR |  |
| 3 | ♠:2-290-630-00 | STOPPER, HOLDER |  |
| 4 | X-2290-616-0 | CASING ASSY (AEP MODEL/GRAY)(UK MODEL) |  |
|  | X-2374-604-0 | CASING ASSY (AEP MODEL/SILVER)(E MODEL) |  |
|  | **X-2290-626-0** | **CASING ASSY (AEP MODEL/RED)** |  |
|  | **X-2290-627-0** | **CASING ASSY (AEP MODEL/WHITE)** |  |
| 5 | 2-290-633-00 | PUSH BUTTON (M) |  |
| 6 | 2-290-632-00 | PUSH BUTTON (L) |  |
| 7 | 2-374-636-00 | RUBBER (L), CONTACT |  |
| 8 | ♠:1-610-257-00 | IR-13 BOARD |  |
| 9 | 2-298-402-00 | MIRROR |  |
| 10 | 2-290-608-00 | PLATE, FROSTED |  |
| 11 | 2-290-606-00 | COVER, BATTERY (AEP MODEL/SILVER)(E MODEL) |  |
|  | 2-290-606-11 | COVER, BATTERY (AEP MODEL/GRAY)(UK MODEL) |  |
|  | **2-290-606-11** | **COVER, BATTERY (AEP MODEL/RED)** |  |
|  | **2-290-606-11** | **COVER, BATTERY (AEP MODEL/WHITE)** |  |
| 12 | 2-290-611-00 | CASE, LOWER (AEP MODEL/SILVER)(E MODEL) |  |
|  | 2-290-611-11 | CASE, LOWER (AEP MODEL/GRAY)(UK MODEL) |  |
|  | **2-290-611-11** | **CASE LOWER (AEP MODEL/RED)** |  |
|  | **2-290-611-11** | **CASE LOWER (AEP MODEL/WHITE)** |  |
| 13 | 4-352-958-00 | STRAP, HAND |  |

## 5. ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- =>: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.
- Items marked " ♠ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS

- MF : μF, PF : μμF

RESISTORS

- All resistors are in ohms
- F : nonflammable

COILS

- MMH : mH, UH : μH

When indicating parts by reference number, please include the board name.

| Ref.No. | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| | ♠:1-610-257-00 | IR-13 BOARD<br>*********** | | | | |
| | 2-290-601-00 | TERMINAL (A), BATTERY | | | | |
| | 2-290-602-00 | TERMINAL (B), BATTERY | | | | |
| | | CAPACITOR | | | | |
| C1 | 1-102-108-00 | CERAMIC | 150PF | 10% | 50V | |
| C2 | 1-102-108-00 | CERAMIC | 150PF | 10% | 50V | |
| | | DIODE | | | | |
| D1 | => 8-719-193-03 | DIODE SE303AX | | | | |
| D2 | 8-719-193-03 | DIODE SE303AX | | | | |
| D3 | => 8-719-901-44 | DIODE SLP144B | | | | |
| | | IC | | | | |
| IC1 | 8-759-600-07 | IC M50119P | | | | |
| | | TRANSISTOR | | | | |
| Q1 | 8-729-378-84 | TRANSISTOR 2SD788 | | | | |
| | | RESISTOR | | | | |
| R1 | 1-247-797-00 | CARBON | 39 | 5% | 1/6W | |
| R2 | 1-247-771-00 | CARBON | 3.3 | 5% | 1/6W | |
| R3 | 1-247-771-00 | CARBON | 3.3 | 5% | 1/6W | |
| R4 | 1-247-825-00 | CARBON | 560 | 5% | 1/6W | |
| | | CRYSTAL | | | | |
| X1 | 1-527-476-00 | OSCILLATOR, CERAMIC | | | | |

**English**
83G0990-1
Printed in Japan
© 1983

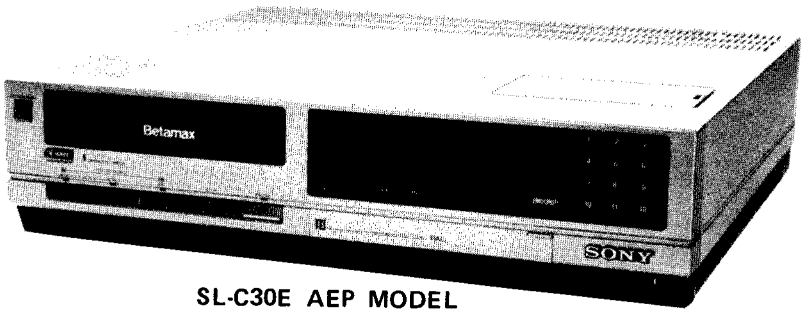
9-972-245-01

**Sony Corporation**

# SL-C30E/C30UB

# ADJUSTMENT MANUAL

*AEP Model*
*UK Model*
*E Model*



SL-C30E AEP MODEL

July, 1983

**711B** CHASSIS

File this adjustment manual with the service manual.

Beta
VIDEO CASSETTE RECORDER
SONY®

MICROFILM

Consumer
VIDEO

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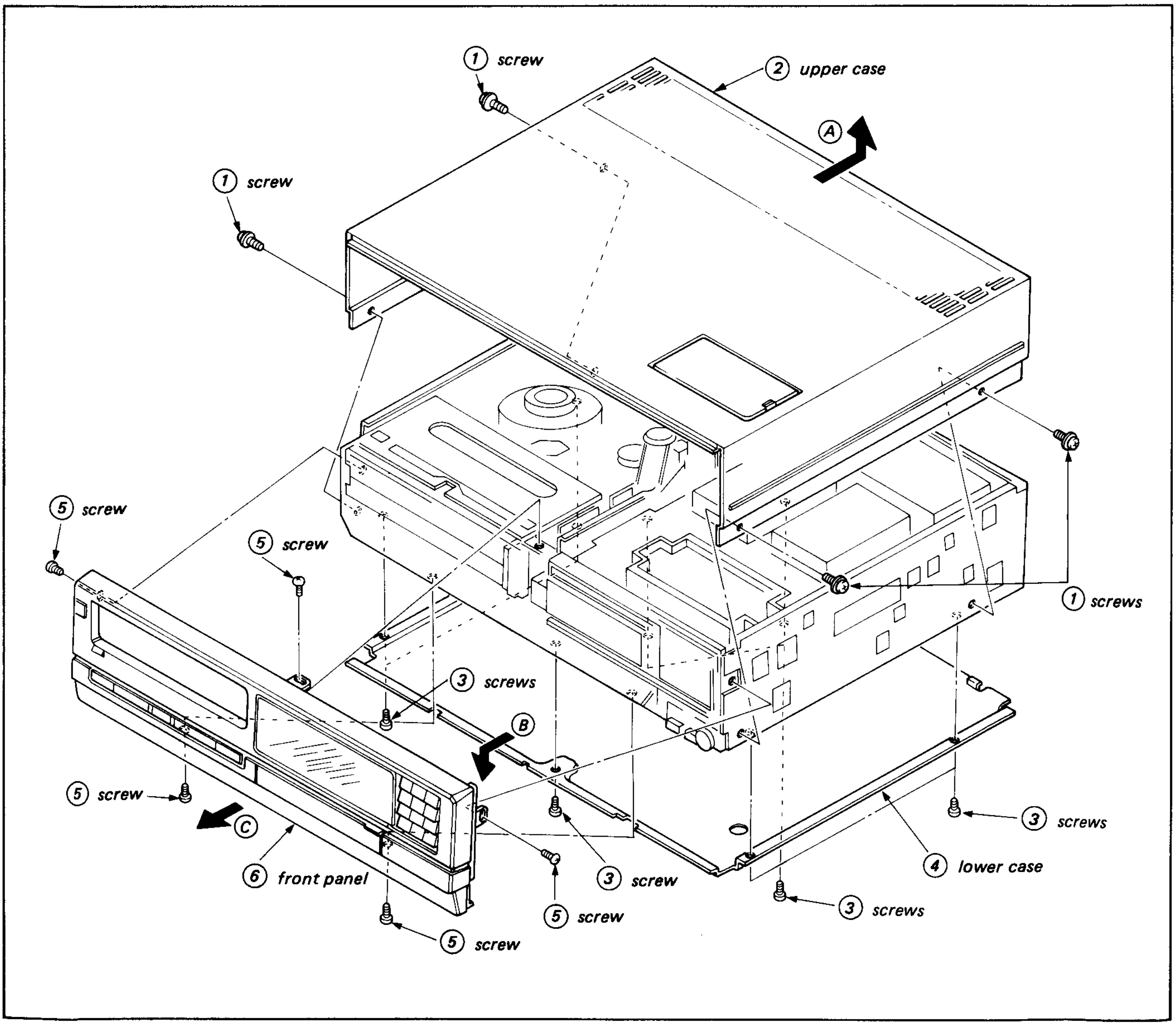
# SECTION 1

# PREPARATION FOR MECHANICAL SECTION CHECK, ADJUSTMENT, AND REPLACEMENT

## 1-1. REMOVAL OF THE CASE AND FRONT PANEL

1) Remove the four screws ①.
2) Remove the upper case ② in the direction shown by the arrow Ⓐ.
3) Remove the seven screws ③ and the lower case ④ in the direction shown by the arrow Ⓑ.
4) Remove the five screws ⑤ and the front panel ⑥ in the direction shown by the arrow Ⓒ.



① screw
② upper case
Ⓐ
① screw
⑤ screw
⑤ screw
① screws
③ screws
Ⓑ
⑤ screw
Ⓒ
⑥ front panel
③ screw
⑤ screw
③ screws
④ lower case
③ screws
⑤ screw

*Fig. 1-1. Removal of the Case and Front Panel*

### 1-2. DISMOUNTING THE RY-1 BOARD

1) Stand the set with the right side panel on the bottom.
2) Remove the two screws ①, holding the RY-1 board.
3) Swing open the RY-1 board in the direction shown by the arrow Ⓐ and rest it on a cassette.

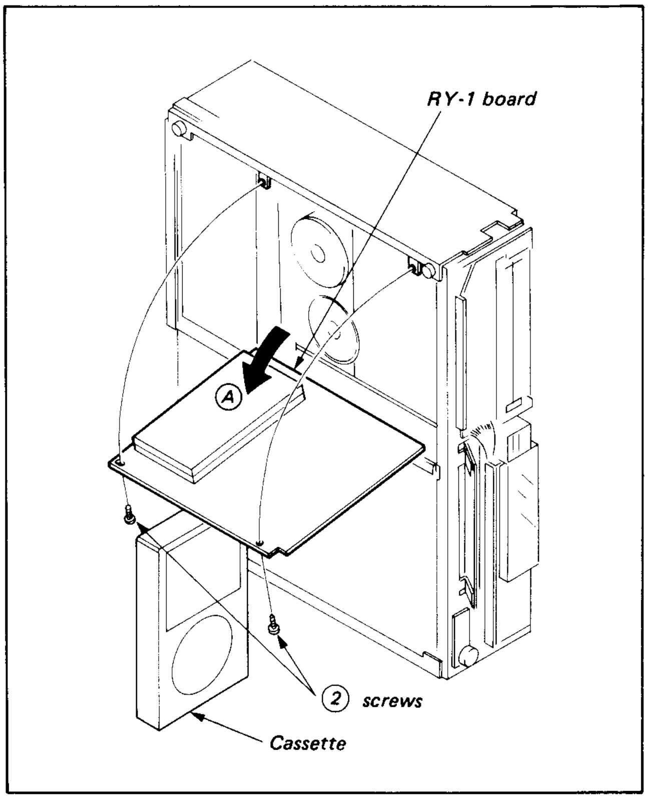


*Fig. 1-2. Dismounting the RY-1 Board*

### 1-3. DISMOUNTING THE TU-39 BOARD

1) Place the set upside down.
2) Remove the four screws ① holding the TU-39 board.
3) Remove the TU-39 board in the direction shown by the arrow Ⓐ.

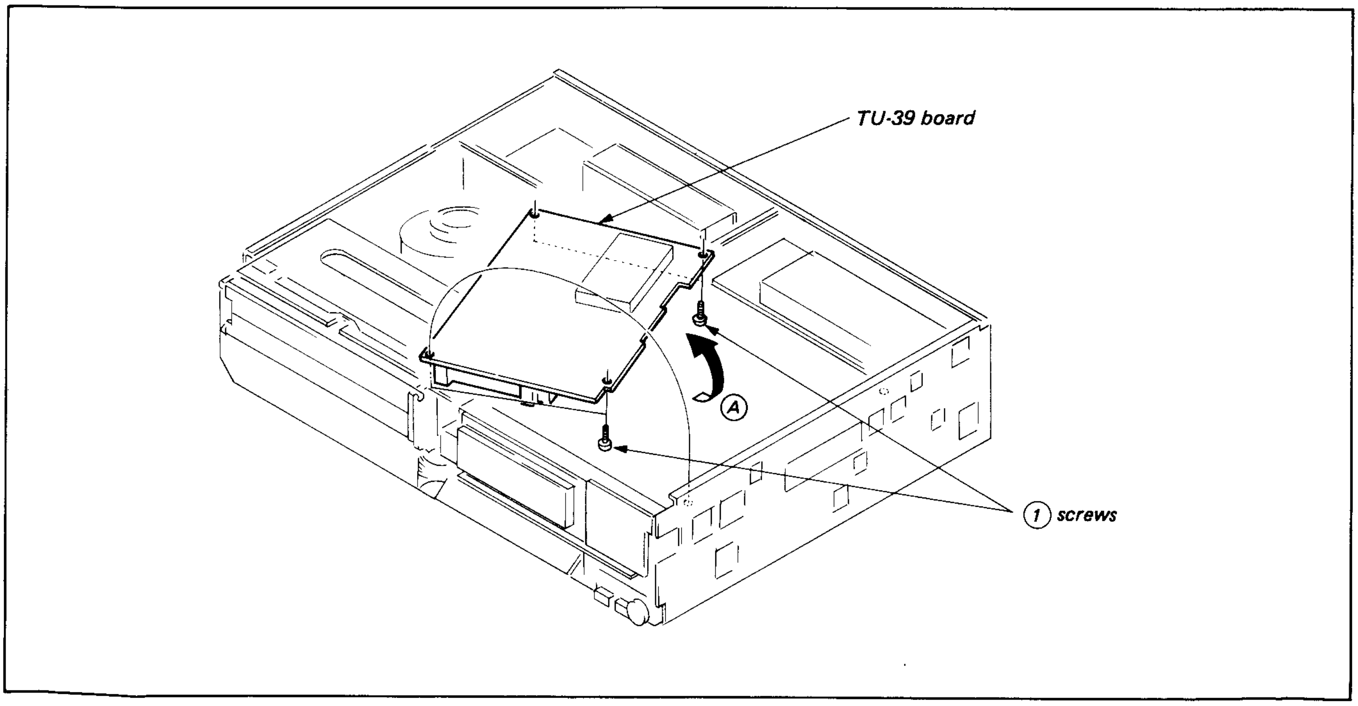


*Fig. 1-3. Dismounting the TU-39 Board*

## 1-4. DISMOUNTING THE YC-25 BOARD

1) Stand the set with the power source side on the bottom.
2) Remove the screw ① and the panel connector ②.
3) Remove the four screws ③, holding the YC-25 board.
4) Swing open the YC-25 board in the direction shown by the arrow Ⓐ and rest it on a cassette.

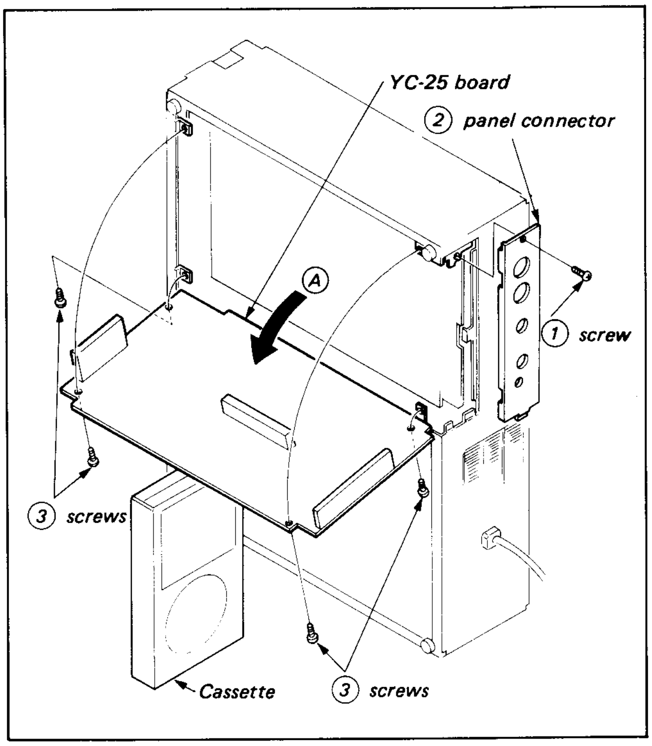

YC-25 board
② panel connector
Ⓐ
① screw
③ screws
Cassette
③ screws

*Fig. 1-4. Dismounting the YC-25 Board*

## 1-5. REMOVING OF POWER BLOCK

1) Remove the two screws ①, and the shield plate.
2) Pull out the six connectors ②, (CN1, 2, 3, 4, 5, 6) from the power block side.
3) Remove the three screws ③ and the power cord bracket.
4) Remove the five screws ④, holding the power block.
5) Remove the power block in the direction shown by the arrow Ⓐ.

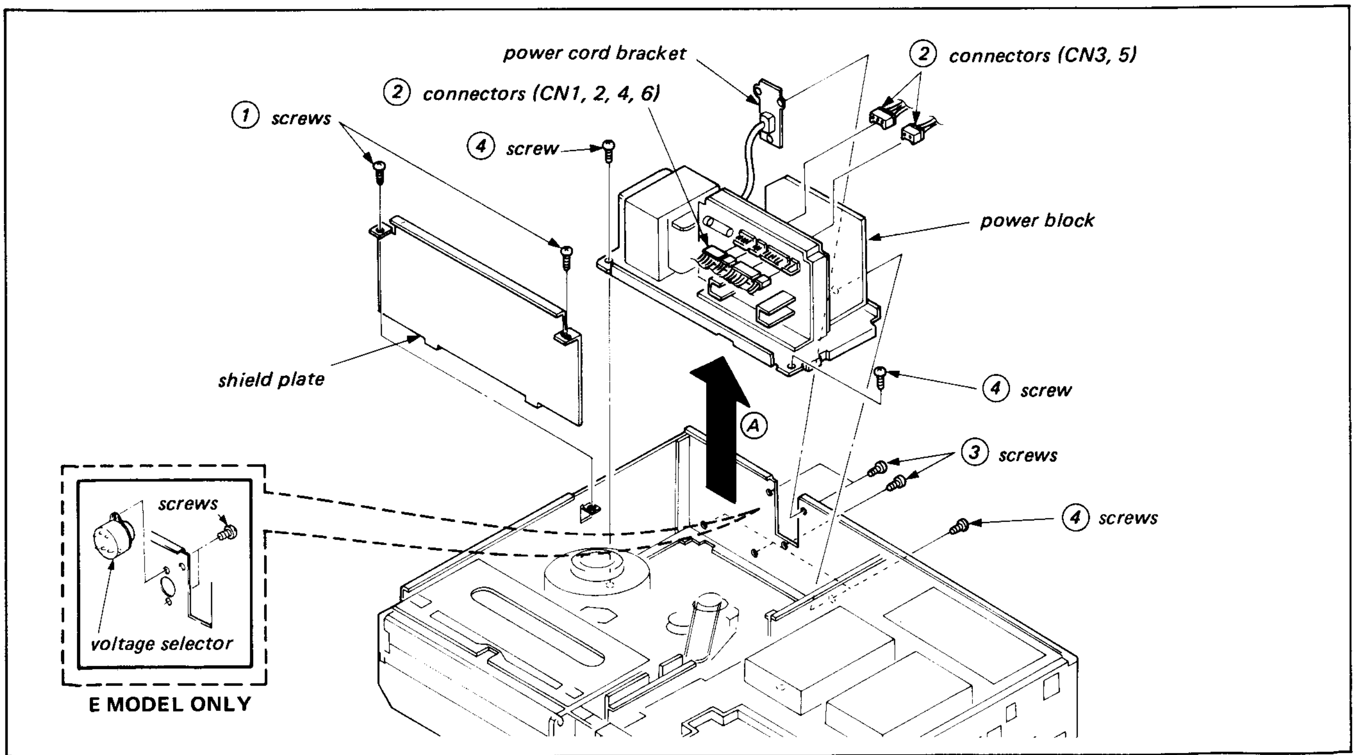

power cord bracket
② connectors (CN3, 5)
② connectors (CN1, 2, 4, 6)
① screws
④ screw
power block
shield plate
④ screw
Ⓐ
③ screws
④ screws
screws
voltage selector
E MODEL ONLY

*Fig. 1-5. Removing of Power Block*

## 1-6. MECHANICAL OPERATION AFTER REMOVING THE FL CASSETTE COMPARTMENT

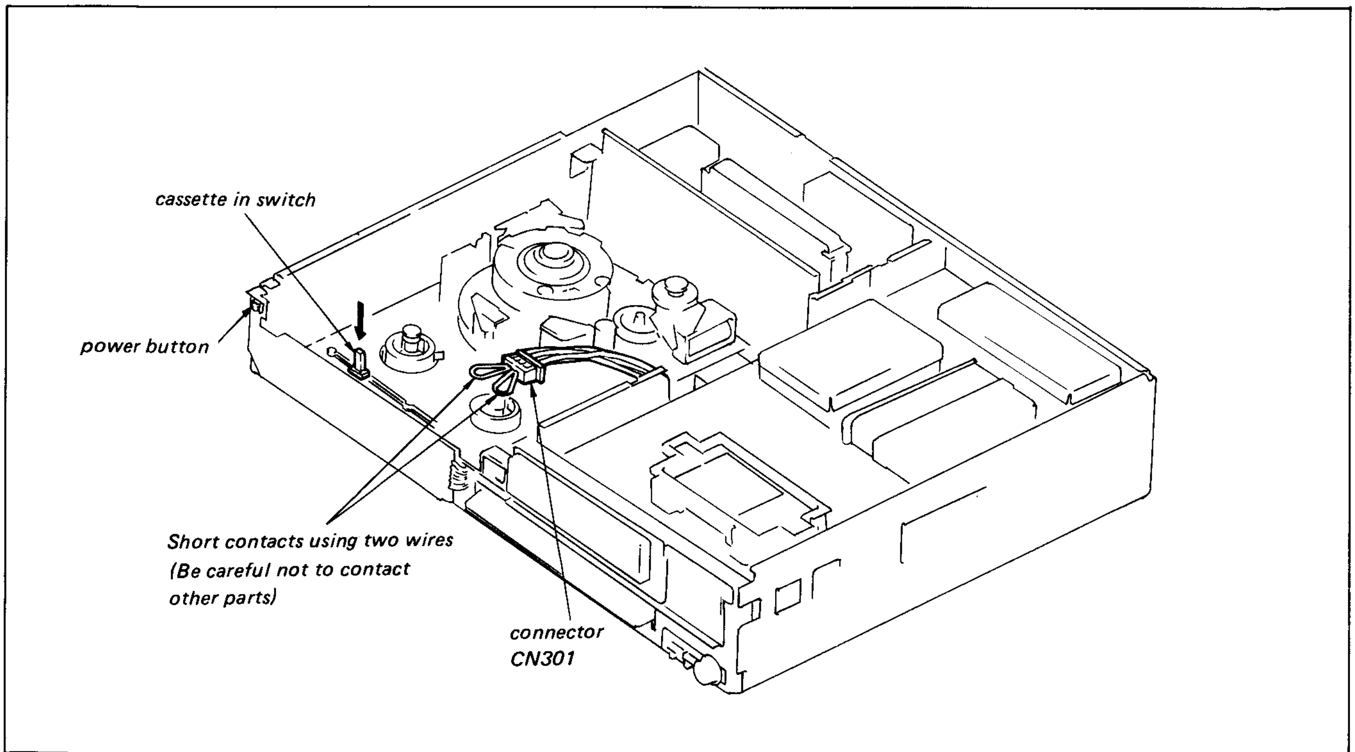
### 1-6-1. Attaining Threading Complete State after Removing the FL Cassette Compartment.

Refer to Section 3-6 describing the dismounting of the FL cassette compartment.

1) Short Pins (1) and (2) and also Pins (3) and (4) of the connector (CN301) on the CS-3 board using two wires.

   **Caution:**
   Do not contact other parts in the set with the wires.

2) Threading is started by turning on the POWER button while pushing the CASSETTE IN switch with a finger.



cassette in switch
power button
Short contacts using two wires
(Be careful not to contact
other parts)
connector
CN301

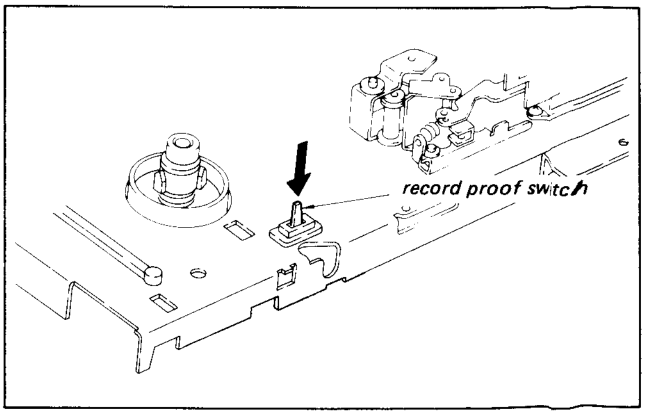
*Fig. 1-6. Threading After Removing FL Cassette Compartment*

### 1-6-2. Setting Up PLAY Mode without Inserting a Cassette

Press the PLAY button after setting up the threading complete state as described in 1-6-1.

### 1-6-3. Setting Up REC Mode without Inserting a Cassette

1) Thread as described in 1-6-1, then press the RECORD PROOF switch shown in the diagram.
2) Press the REC button while depressing the RECORD PROOF switch.



record proof switch

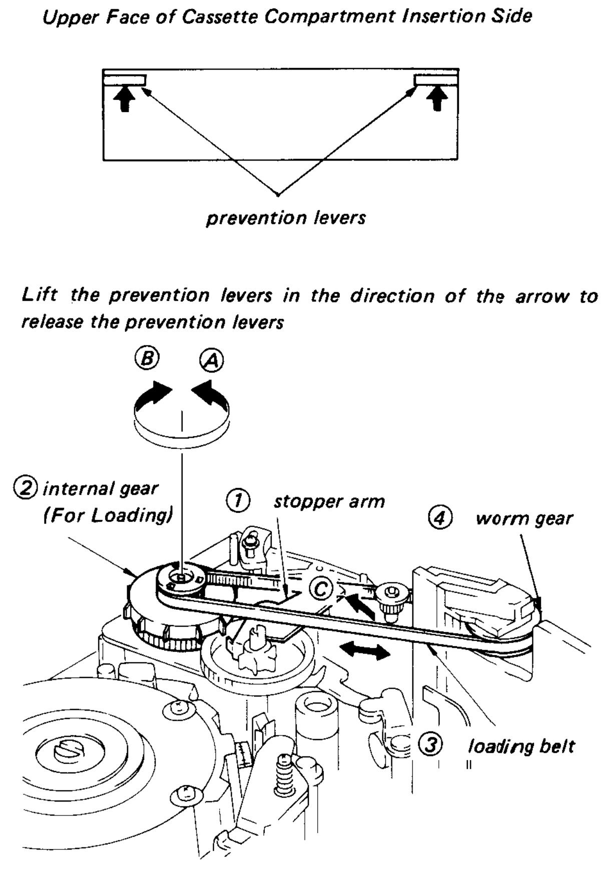
*Fig. 1-7. Setting Up the REC Mode After Removing FL Cassette Compartment.*

## 1-7. LOADING, THREADING, UNLOADING, AND UNTHREADING WHILE THE POWER IS OFF

### 1-7-1. Manual Loading and Unloading

1) Press stopper arm ① in the direction of the arrow Ⓒ after releasing the prevention levers on the right and left sides inside the cassette compartment. Unlock the internal gear ②.
2) Rotate the internal gear ② in the direction of the arrow Ⓐ until loading is completed.
3) Rotate the internal gear ② in the direction of the arrow Ⓑ during unloading.

**Note:**
Rotate the worm gear ④ with a finger to load and unload when the loading belt ③ has become detached.


Upper Face of Cassette Compartment Insertion Side
prevention levers
Ⓑ
Ⓐ
② internal gear (For Loading)
① stopper arm
④ worm gear
Ⓒ
③ loading belt

*Lift the prevention levers in the direction of the arrow to release the prevention levers*

*Fig. 1-8. Manual Loading and Unloading*

### 1-7-2. Manual Threading and Unthreading

1) Rotate the loading gear in direction of the arrow Ⓐ until threading is completed.
2) Rotate the loading gear in the direction of the arrow Ⓑ for unthreading.

**Caution:**
Do not use a screwdriver, or other item, to rotate the loading gear. Push the side of the gear with a finger to rotate.

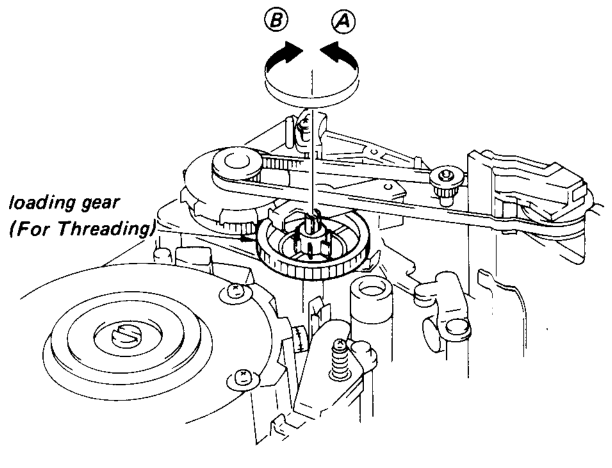

Ⓑ
Ⓐ
loading gear (For Threading)

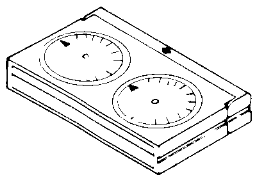
*Fig. 1-9. Manual Threading and Unthreading*

## 1-8. TOOLS AND FIXTURES REQUIRED

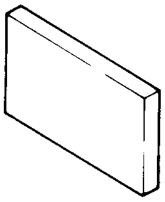
| Ref. No. | Name | Part No. | Fixture No. |
|---|---|---|---|
| J-1 | Forward-Back Tension Measurement Tape | J-6080-003-C | SL-0003C |
| J-2 | Parallel Plate | J-6086-750-A | SL-0657 |
| J-3 | Small Adj. Mirror<br>Spare Mirror | J-6080-029-A<br>J-6080-030-1 | SL-5052 |
| J-4 | Alignment Tape | 8-969-995-52 | KR5-2H |
| J-5 | Cleaning Fluid | Y-2031-001-0 | |
| J-6 | Thickness Gauge | 9-911-053-00 | |
| J-7 | Cleaning chamois | 2-034-697-00 | |
| J-8 | Head Demagnetizer | | |
| J-9 | Lapping Tape | 8-888-004-00 | |
| J-10 | Dihedral Adj. Screw | J-6080-013-1 | SL-0013 |
| J-11 | Sector type gauge 50 g Max | 7-732-050-20 | |
| J-12 | Reel Table Tension Fixture | J-6080-011-A | SL-0011 |

ITEMS J-5, J-6, J-7, J-8 can be obtainted locally

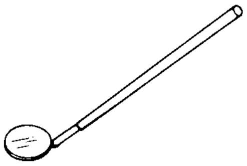
J-1



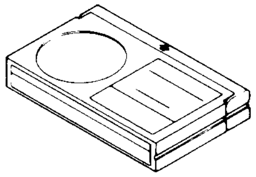
J-2



J-3

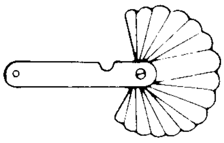


J-4

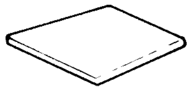


J-5

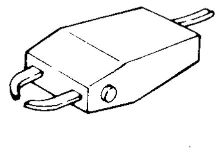
J-6



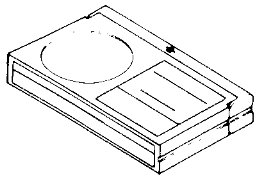
J-7



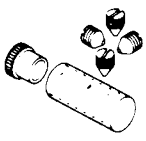
J-8



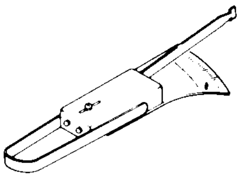
J-9



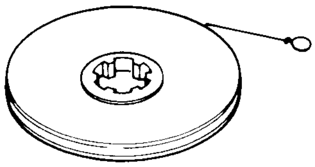
J-10



J-11



J-12



# SECTION 2
# PERIODIC CHECK AND MAINTENANCE

The following maintenance and periodic checks are recommended to ensure optimum machine function and performance and to prolong machine and tape life.

## 2-1. MAINTENANCE AFTER REPAIR

Carry out maintenance work for the following items after repairing the machine regardless of the period of use.

### 2-1-1. Rotary Head Disc Assembly

1) Place a piece of chamois (tool Ref. No. J7) soaked in cleaning fluid (tool Ref. No. J5) lightly against the rotary drum assembly and clean the rotary head disc assembly by slowly rotating it by hand. (Important-Do not clean by rotating with the motor on.)
2) Do not clean the head tip by moving the chamois in a vertical direction. This may damage the head tip.

### 2-1-2. Cleaning of the Tape Transportation System

Clean the tape contact surfaces, such as the tape guide, drum assembly surfaces, capstan, and pinch roller using cleaning piece etc. soaked in cleaning fluid.

### 2-1-3. Cleaning of the Drive System

Clean the driving elements (reel base surfaces, etc.) using a cloth soaked in cleaning fluid.

## 2-2. PERIODIC CHECK ITEMS

Carry out maintenance checks for the following items depending on the duration of use.

| Maintenance & Check | Operating Hours (H) | 500 | 1,000 | 1,500 | 2,000 | 2,500 | 3,000 | 3,500 | 4,000 | 4,500 | 5,000 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tape Trans-Portation System | Cleaning of tape transportation system | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | This cleaning must be done whenever a repair is made. |
| | Cleaning and degaussing of ACE ass'y | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Cleaning & degaussing of video disk ass'y | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | The life of the head varies, depending on operational conditions and method. |
| Driving System | Loading belt | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ★ | ○ | ○ | • This cleaning must be done whenever a repair is made.<br>• Replacement must be done depending on operating hours on the table, or every two years. |
| | Cleaning of iron core and opening of solenoid | – | – | – | ○ | – | – | – | ○ | – | – | Wipe iron core and opening of solenoid with dry cloth. |
| Performance Confirmation | Abnormal sound | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | Adjust or replace the section which causes abnormal sound. |
| | Measurement of FWD back tension | – | ☆ | – | ☆ | – | ☆ | – | ☆ | – | ☆ | Confirmation must be made according to section<br>Specified value: 30 ± 5 g·cm<br>(When measured with torque cassette tape) |
| | Confirmation of brake system | – | ☆ | – | ☆ | – | ☆ | – | ☆ | – | ☆ | Confirmation must be made according to section |
| | Confirmation of record & playback functions | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | Perform the confirmation whenever repair is made. |

○ Cleaning ★ Replacement ☆ Confirmation

**Note:** When overhauling, refer to the above for part replacement.

# SECTION 3

# CHECK, ADJUSTMENT, AND REPLACEMENT PROCEDURES

## 3-1. REPLACEMENT OF ROTARY HEAD DISC ASSEMBLY

### 3-1-1. Removal of Rotary Head Disc Assembly

1) Unscrew the two screws ① holding the damper assembly and remove it.
2) Remove the hexagonal socket bolt ② with an Allen wrench and dismount the upper drum assembly.

   **Note:**
   Remove the upper drum while rotating it, without moving the adjust plate ④. Be very careful not to move the adjust plate ④, or tape path will be affected.
3) Unsolder the rotary head disc circuit board. (four red and white lead wires)
4) Remove the two hexagonal socket bolts ③ and dismount the disc assembly.

   **Note:**
   Be very careful not to touch the head tip, or touch it against anything.

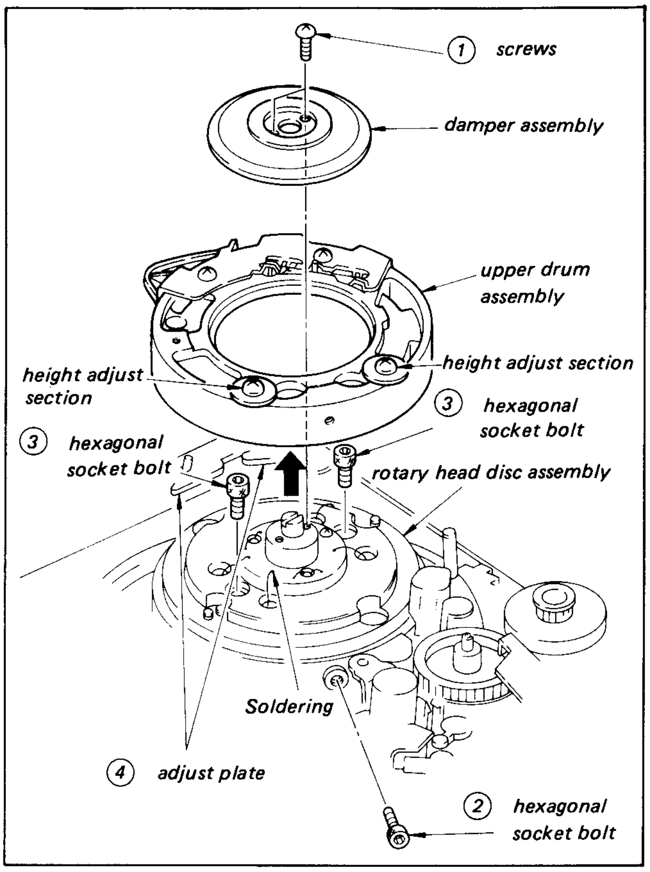

① screws
damper assembly
upper drum assembly
height adjust section
height adjust section
③ hexagonal socket bolt
③ hexagonal socket bolt
rotary head disc assembly
Soldering
④ adjust plate
② hexagonal socket bolt

*Fig. 3-1. Dismounting the Rotary Head Disc Assembly*

### 3-1-2. Replacement

1) Position the rotary head disc, paying attention to the direction of the red and white lead wires.
2) Tighten the hexagonal socket bolt ③ and solder the lead wire.

   **Note:**
   Solder securely, being careful not to break the lead wires.
3) Mount the upper drum without moving the adjust plates ④ as when dismounting it and tighten the hexagonal socket bolt ② while pressing two height adjust sections.

   **Caution:**
   Be careful not to touch the head tip when replacing the drum.

   **Note:**
   When replacing the rotary drum head, it may be difficult to remove it from the head disc. In this event, follow the procedure below. (Fig. 3-2)

   (1) Remove the hexagonal socket bolts ③ bolting the rotary head disc assembly.
   (2) When the rotary head disc assembly is fitted tightly and cannot be readily dismounted, alternately and slowly insert the two hexagonal socket bolts ③ unbolted in (1) above it removal holes at 90° to the mounting holes. The rotary head disc assembly can be lifted by the force of the two screws and dismounted easily.

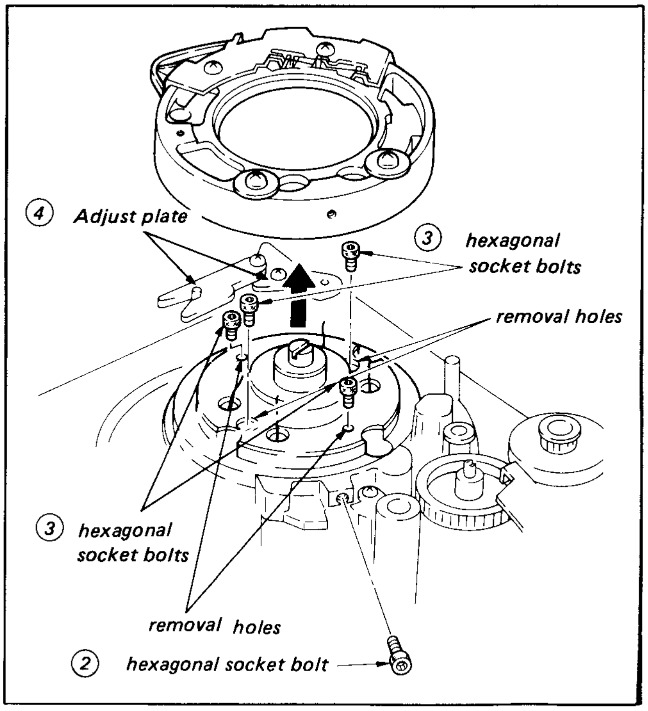

④ Adjust plate
③ hexagonal socket bolts
removal holes
③ hexagonal socket bolts
removal holes
② hexagonal socket bolt

*Fig. 3-2. Replacing Rotary Head Disc Assembly*

## 3-2. VIDEO HEAD DIHEDRAL ADJUSTMENT

Generally this adjustment is not necessary except after video head disc replacemet. (Video head discs for repair and replacement are precision adjusted using a microscope, and there is virtually never a need for readjustment.)
When determining the appropriate video head angle, play back an alignment tape. Make sure the tracking control knob is set at the center click position. When the check is made at a position other than the center click (tracking is off), the pictures will be played back as if the angle is wrong even if it is correct.
Be sure the ACE assembly position adjustment is completed (refer to "Tape Path Adjustment") before making this adjustment.

### [Checking Method]

Play back the monoscope signal section of the alignment tape (KR5-2H) after setting the tracking control knob at the center click position . Verify that only one monoscope perpendicular line is played back immediately underneath the switching pulse, and not two lines.
If only one perpendicular line can be seen, the angle is correct, and no adjustment is needed.
If there are two, adjust as follows.

### [Adjustment Procedure]

1. As shown in Fig. 3-3, screw in the two angle adjustment screws (Tool Ref. No.J-10) so that the lead wires from the video head are on the same level as the red adjusting screw hole and the top of the adjusting screw hole, and the top of the adjusting screw is on the same level as the top of the video head disc.
   (If not screwed in sufficiently, the heads of the adjustment screws hit the upper drum, and the video head disc no longer rotates. Conversely, if they are screwed in too far, the head base moves, and the angle of the video head shifts considerably.)

   **Caution:**
   The white lead wire is a reference wire and should never be moved.
2. Screw in either one of the two adjustment screws until it feels tight. Additional tightening beyond this position moves the video head and so the angle can be adjusted.
3. Play back the monoscope signal section of the alignment tape (KR5-2H) and verify the angle. If the angle of the perpendicular line is larger than before adjustment, screw the adjustment screw counterclockwise to loosen and adjust the screw on the other side.
4. After adjusting, unscrew and check again.

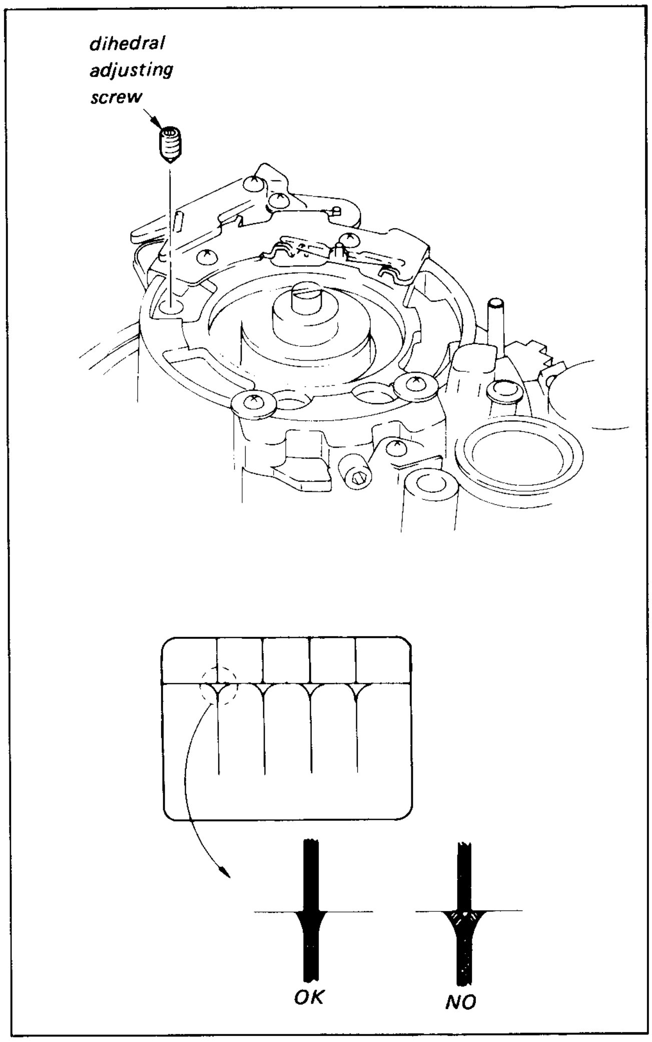


Fig. 3-3. Video Head Dihedral Adjustment (1)

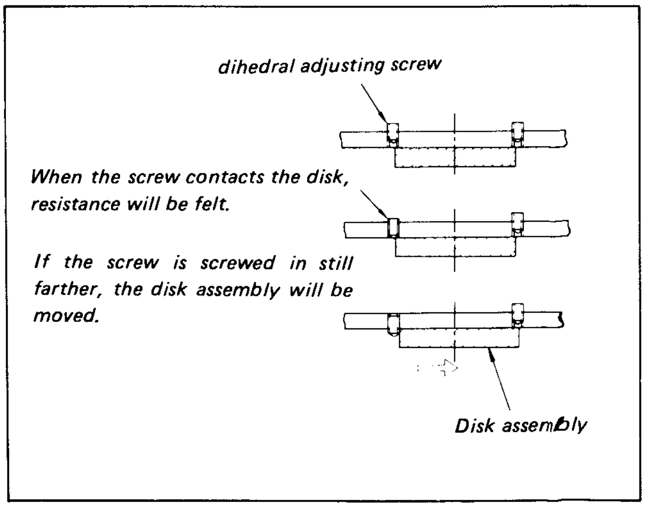

dihedral adjusting screw
When the screw contacts the disk, resistance will be felt.
If the screw is screwed in still farther, the disk assembly will be moved.
Disk assembly

Fig. 3-4. Video Head Dihedral Adjustment (2)

## 3-3. REPLACEMENT AND ADJUSTMENT OF DRUM ASSEMBLY

### 3-3-1. Replacement

1) Measure and record the two gaps ( Ⓐ ) between the upper drum tape holding section and the adjust plates (in Fig. 3-5). (Do not forget to do this, as the adjust plate mounting position affects the tape path.)
2) Unscrew the screws ① shown in Fig. 3-5 and remove the tape guide ground plate and adjust plates (2) and (3-1).
3) Remove the connector and three drum mounting screws from the bottom of the chassis and remove the drum assembly body.
4) Re-assemble the parts in reverse order.
5) Adjust according to "Tape Path Adjustment" after replacing the drum.

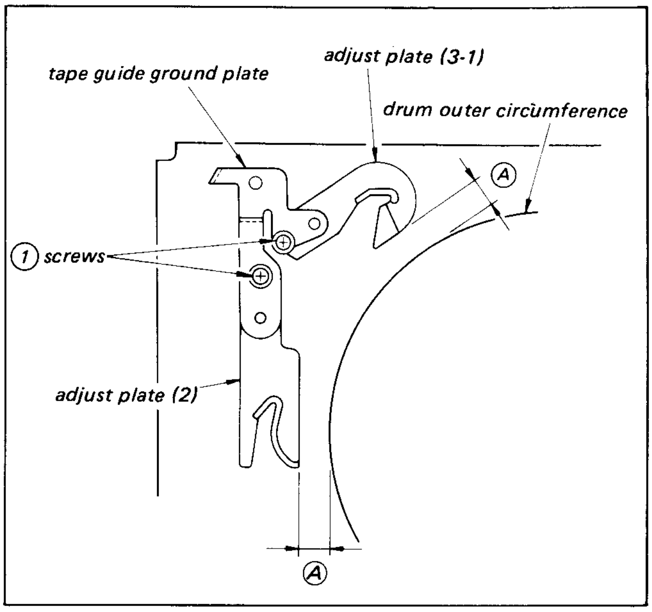

adjust plate (3-1)
tape guide ground plate
drum outer circumference
Ⓐ
① screws
adjust plate (2)
Ⓐ

*Fig. 3-5. Replacing Drum*

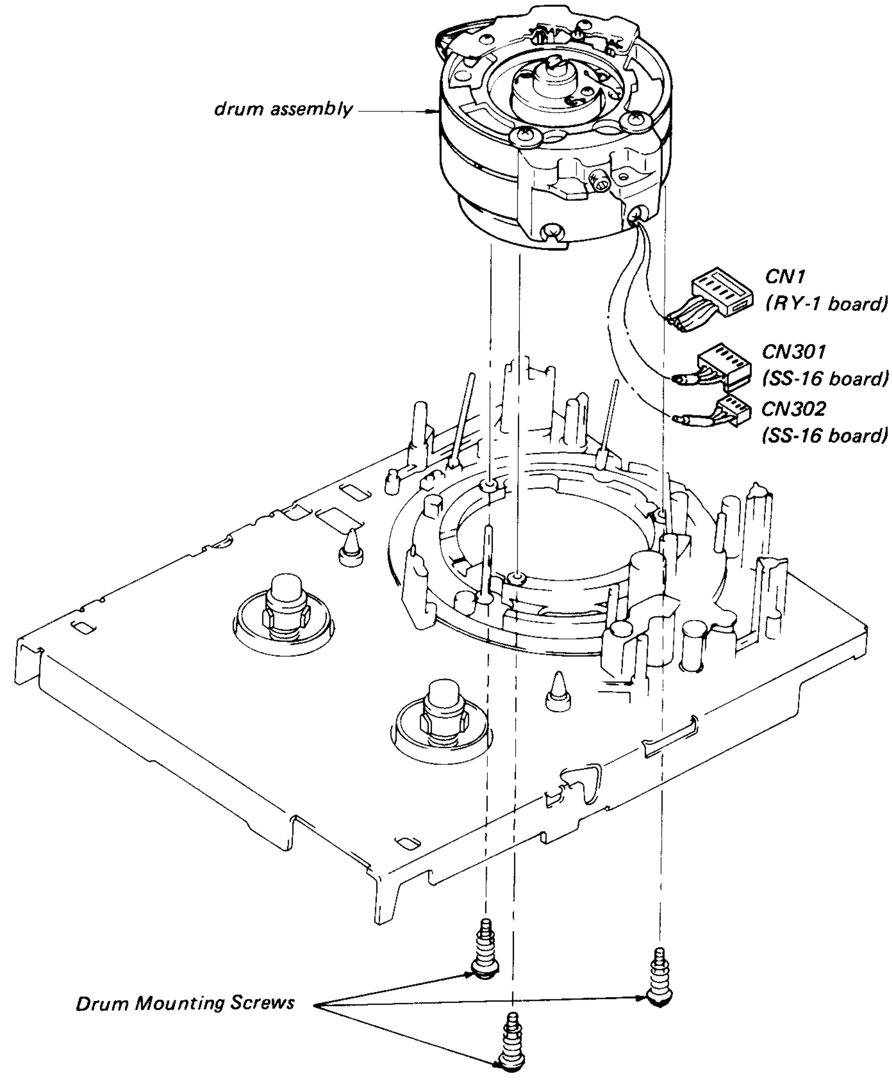

drum assembly
CN1
(RY-1 board)
CN301
(SS-16 board)
CN302
(SS-16 board)
Drum Mounting Screws

*Fig. 3-6. Dismounting Drum Assembly*

### 3-3-2. Motor Clearance Adjustment when Replacing Drum Assembly

When replacing the drum assembly, adjust so that clearance between the rotor and coil is 0.3 — 0.6 mm. (See Fig. 3-7)

**[Procedure]**

1) When re-assembling the drum, use the spacer which was removed and confirm that the 0.3 mm side of the clearance gauge included with the repair drum can be inserted, and that the 0.6 mm side cannot be inserted.
2) If this specification is not satisfied, dispose of the old spacer and use the spacers (0.3 mm × 4) included with the new repair drum as needed.

* **Clearance Confirmation**

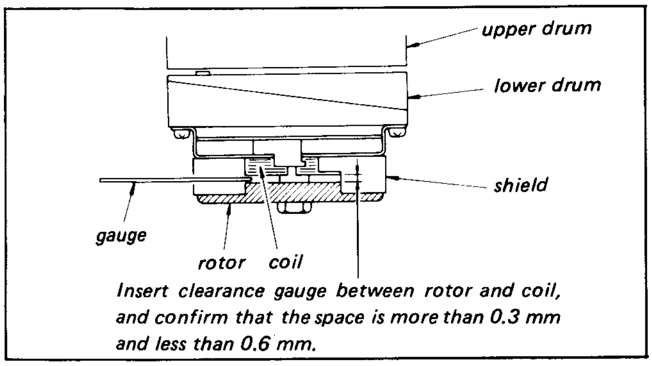

upper drum
lower drum
shield
gauge
rotor
coil
Insert clearance gauge between rotor and coil, and confirm that the space is more than 0.3 mm and less than 0.6 mm.

*Fig. 3-7. Adjusting Motor Clearance When Replacing Drum Assembly*

**[Removal of Stator, Rotor]**

1) Remove nut ① and washer ②.
2) Remove rotor ③ from stator ④.
3) Unscrew the two screws ⑤ and remove stator from drum body.

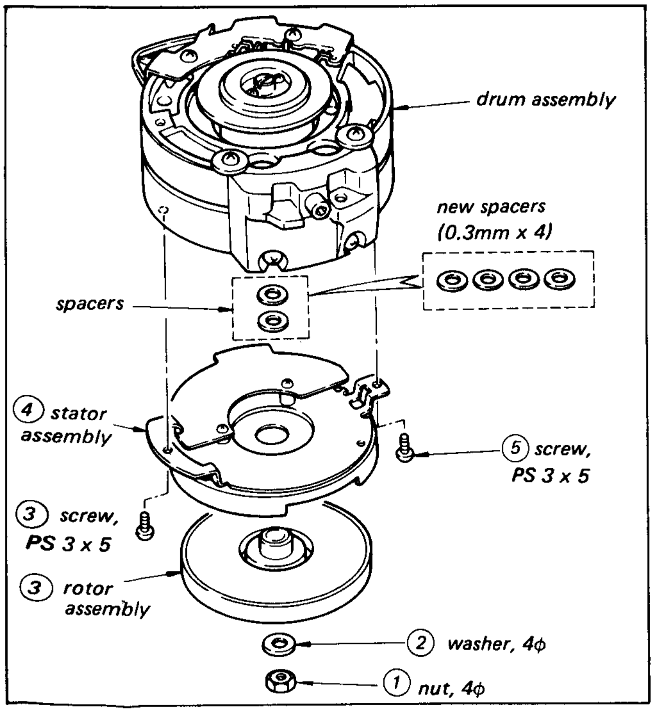

drum assembly
new spacers
(0.3mm x 4)
spacers
④ stator assembly
⑤ screw,
PS 3 x 5
③ screw,
PS 3 x 5
③ rotor assembly
② washer, 4ϕ
① nut, 4ϕ

*Fig. 3-8. Dismounting Stator and Rotor When Replacing Drum Assembly*

## 3-4. REPLACEMENT AND ADJUSTMENT OF CAPSTAN MOTOR

### 3-4-1. Removal of the Capstan Motor (Fig. 3-9)

Unscrew screws ①, ②, ③ and remove the capstan motor from the mechanism chassis.

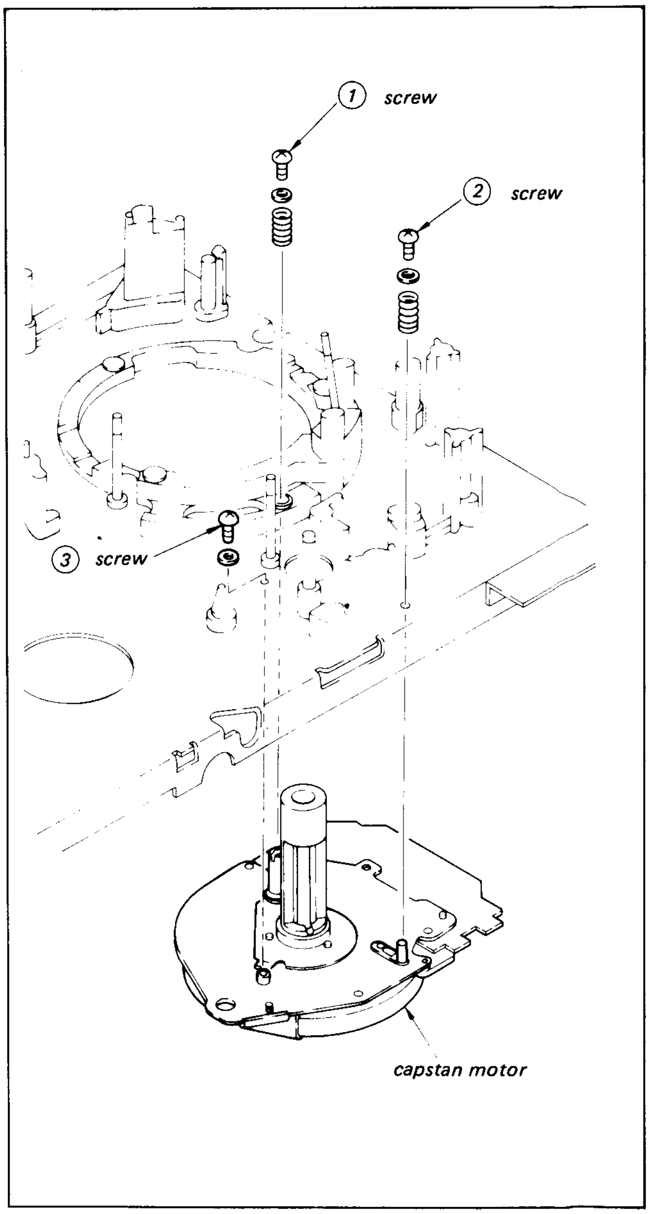

① screw
② screw
③ screw
capstan motor

*Fig. 3-9. Dismounting Capstan Motor*

### 3-4-2. Perpendicular Adjustment of Capstan Spindle

Be sure to adjust as follows after the capstan motor has been replaced or removed:

1) Place parallel plate (Tool Ref. No. J-2) on No. 10 guide sleeve of the pinch press arm assembly perpendicularly, as shown in Fig. 3-10.
2) Loosen screw ①.
3) Rotate adjusting screw ② and align the capstan spindle perpendicularly.
4) Tighten screw ① and fix the capstan motor.
5) Adjust according to "Tape Path Adjustment".

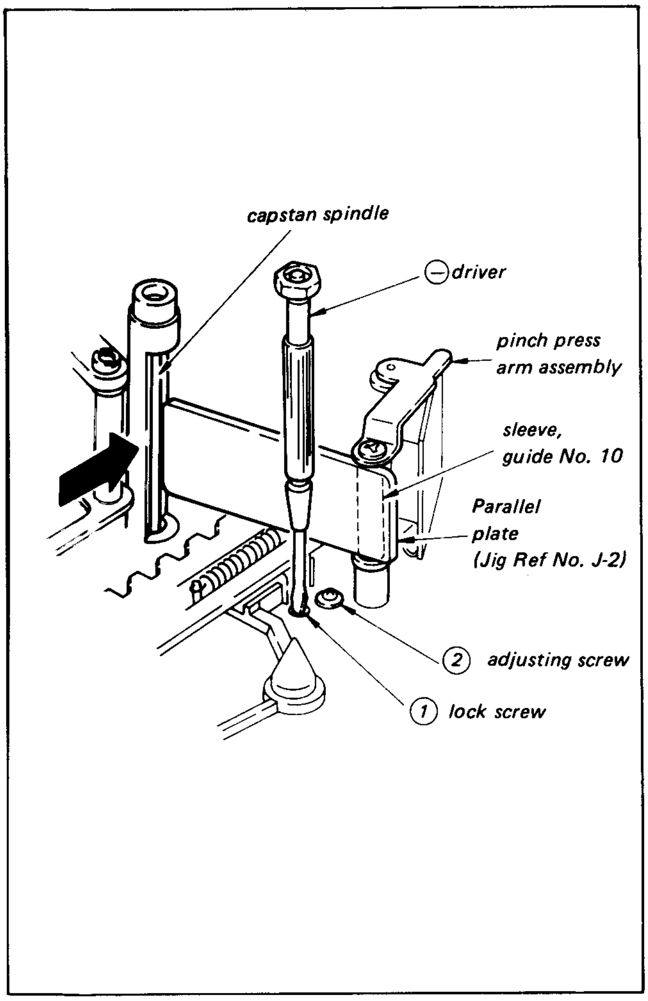

capstan spindle
⊖driver
pinch press arm assembly
sleeve, guide No. 10
Parallel plate (Jig Ref No. J-2)
② adjusting screw
① lock screw

Fig. 3-10. Perpendicular Adjustment of Capstan Motor Spindle

### 3-5. REMOVAL OF S COIL SENSOR ASSEMBLY (Fig. 3-11)

1) Remove spring ① and disengage hook ② to pull out the S coil sensor assembly.
2) Disconnect the connector from CN604 of the SS-16 board.

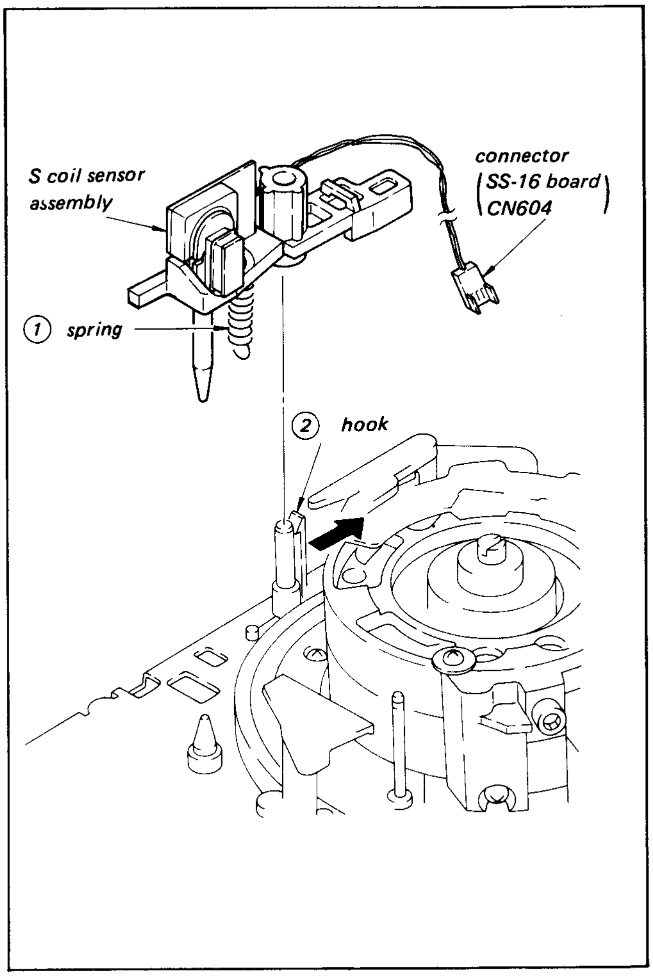

S coil sensor assembly
connector (SS-16 board CN604)
① spring
② hook

Fig. 3-11. Dismounting Tension Pickup Assembly

## 3-6. REMOVAL OF FL CASSETTE COMPARTMENT ASSEMBLY

1) Loosen the loading belt ①, exerting a force on the threading motor.
2) Remove the five mounting screws ② of the FL cassette compartment.
3) Disconnect the exposed connector from the CS-3 board (CN001) on the FL cassette compartment.
4) Lift the FL cassette compartment assembly in the direction shown by the arrow to remove.

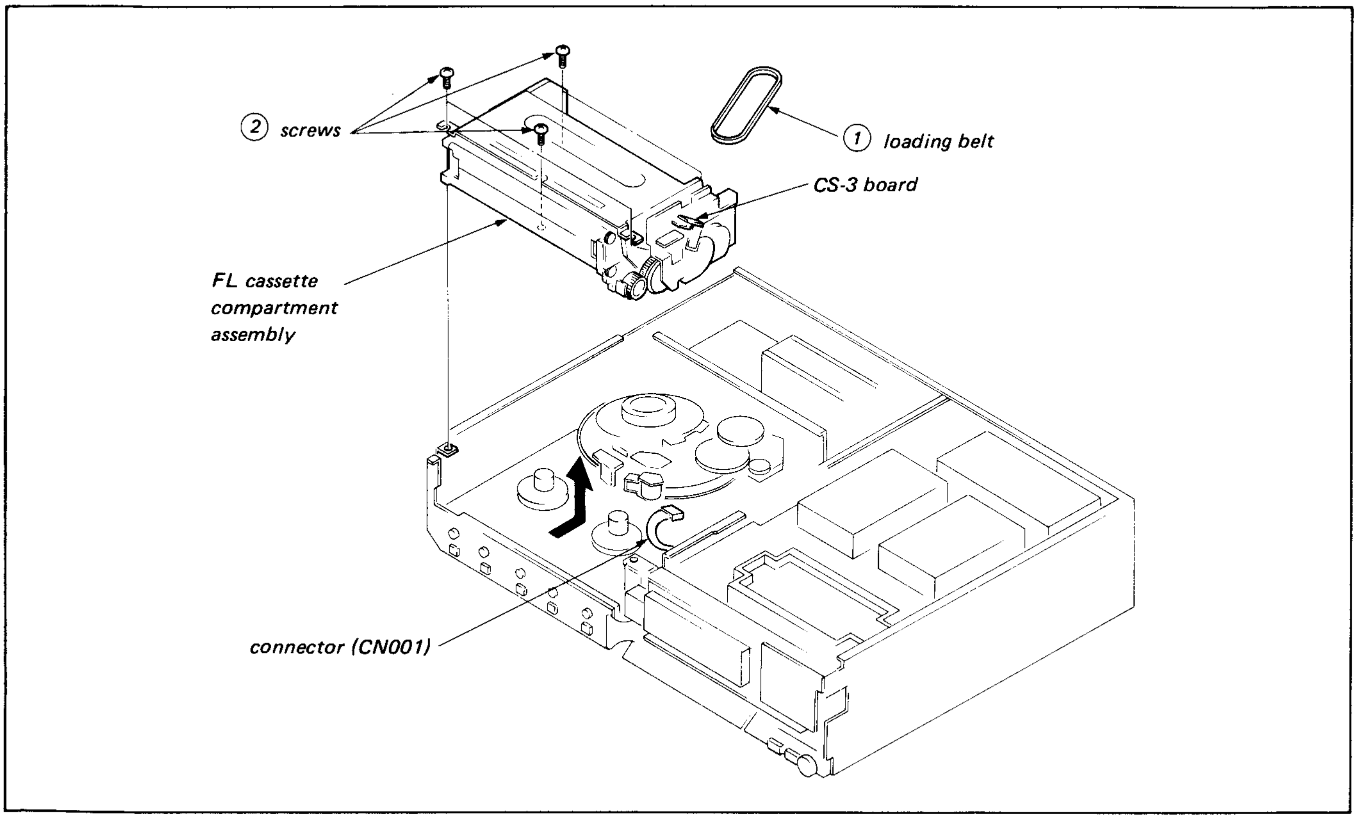

② screws
① loading belt
CS-3 board
FL cassette compartment assembly
connector (CN001)

Fig. 3-12. Removal of FL Cassette Compartment Assembly

## 3-7. ADJUSTMENT OF FL CASSETTE COMPARTMENT ASSEMBLY

### 3-7-1. Mounting of FL Cassette Compartment Assembly (Fig. 3-13, 14)

1) Stretch the two hooks ② of the FL cassette compartment on the mechanism chassis and place the cassette compartment in a predetermined position on the chassis.
2) Mount the FL cassette compartment assembly and loosely tighten the three screws ③.
3) Move the FL cassette compartment assembly longitudinally relative to the mechanism chassis, set in a predetermined position, then securely tighten the three mounting screws ③.
4) Suspend the loading belt ⑦ around the threading motor ④, tension pulley arm ⑤, and worm gear ⑥ and hold the loading belt ⑦ with the internal gear flange ⑧.
5) Push the car tension arm ⑤ in the direction of the arrow, to eliminate slack on the loading belt ⑦, then secure the arm ⑤ with the arm adjustment screw ①.
6) Insert the connector of the wire harness protruding from the body onto the connector CN001 ⑨ of the CS-3 board.

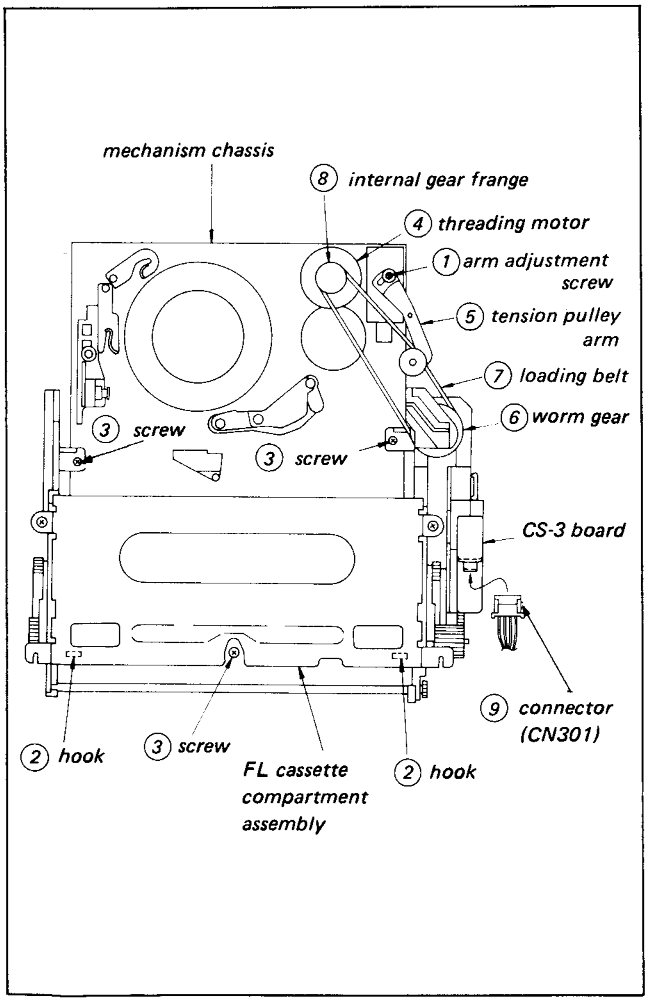

mechanism chassis
⑧ internal gear frange
④ threading motor
① arm adjustment screw
⑤ tension pulley arm
⑦ loading belt
⑥ worm gear
③ screw
③ screw
CS-3 board
⑨ connector (CN301)
② hook
③ screw
FL cassette compartment assembly
② hook

*Fig. 3-13. Remounting FL Cassette Compartment*

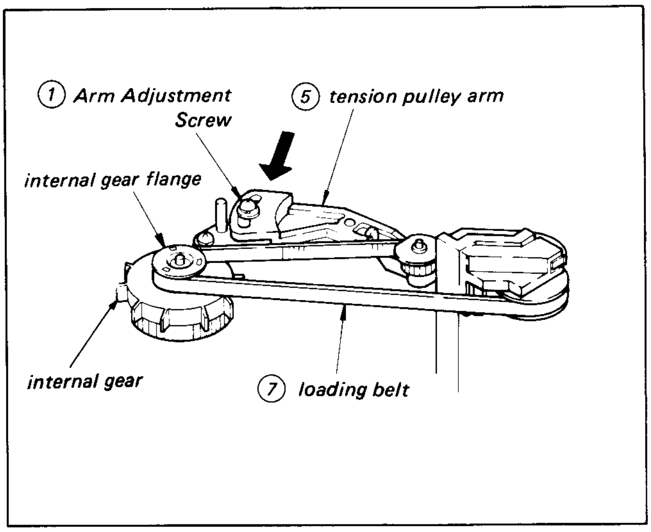

① Arm Adjustment Screw
⑤ tension pulley arm
internal gear flange
internal gear
⑦ loading belt

*Fig. 3-14. Adjustment of Loading Belt*

### 3-7-2. Adjustment of Cassette-ON Switch

Loosen the screw ② which is fixing the cassette-ON cam ①. Move the cassette-ON cam in the arrow direction so that the microswitch (cassette on) ⑤ is turned on when the gap between the left end of the driving roller ③ and the end/face/of the worm gear holder ④ is 8 mm to 10 mm. Then fasten the screw ②.

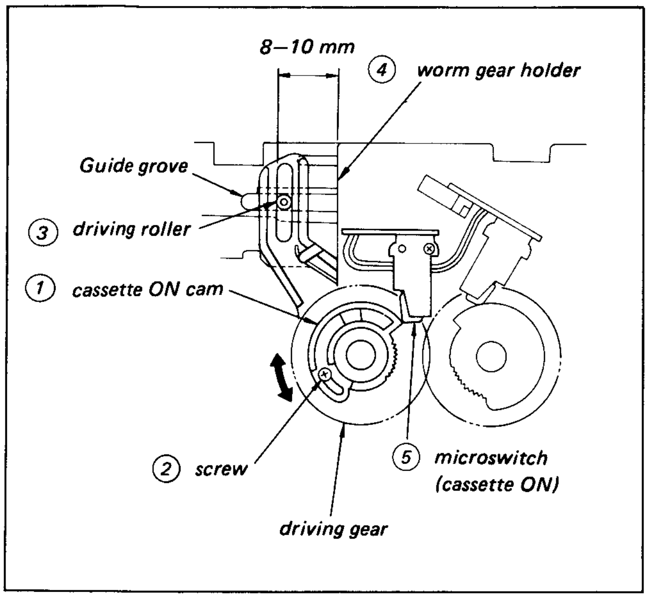

8–10 mm
④ worm gear holder
Guide grove
③ driving roller
① cassette ON cam
② screw
⑤ microswitch (cassette ON)
driving gear

*Fig. 3-15. Cassette-ON Switch Operation Check and Adjustment*

### 3-7-3. Adjustment of Cassette-OFF Switch

Loosen the screw ② which is fixing the cassette-OFF cam ①. Move the cassette-OFF cam in the arrow direction so that the microswitch (cassette off) ⑤ is turned off when the gap between the left end of the driving roller ③ and the end face of the worm gear holder ④ is 16 mm to 18 mm. Then fasten the screw ②.

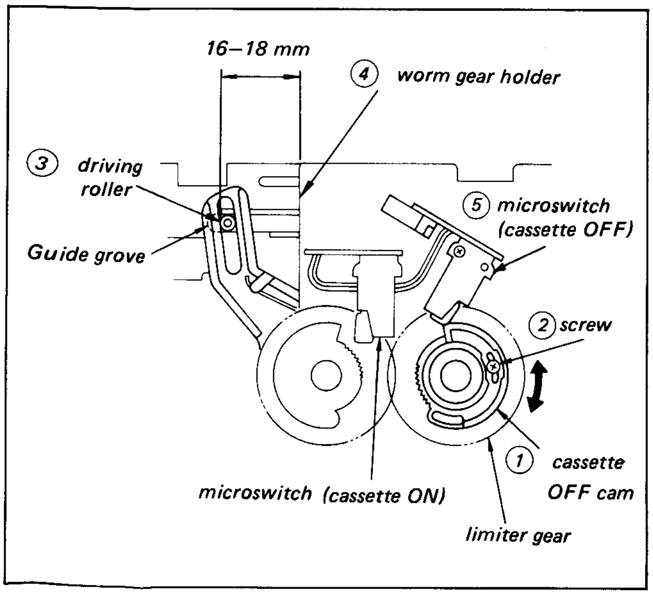

16–18 mm
④ worm gear holder
③ driving roller
Guide grove
⑤ microswitch (cassette OFF)
②screw
① cassette OFF cam
microswitch (cassette ON)
limiter gear

*Fig. 3-16. Cassette-OFF Switch Operation Check and Adjustment*

### 3-7-4. Check and Adjustment of Cassette Door Assembly

**[Check Procedure]**

Be certain that the upper door ② and lower door ③ become perpendicular when the switching door arm ① has fully returned in the direction of the arrow Ⓐ.

**[Adjustment Procedure]**

Check that the switching door rack plate ④ is fully returned, fit in the directions of arrows Ⓑ and Ⓒ so that the upper door ② and lower door ③ become perpendicular when the tips of the switching door rack plate ④ and side plate, right ⑤ mismatch by about 1 mm, then match the teeth. Fit the outer door holder ⑥ into the side plate, right ⑤ and secure the upper door ② and lower door ③.

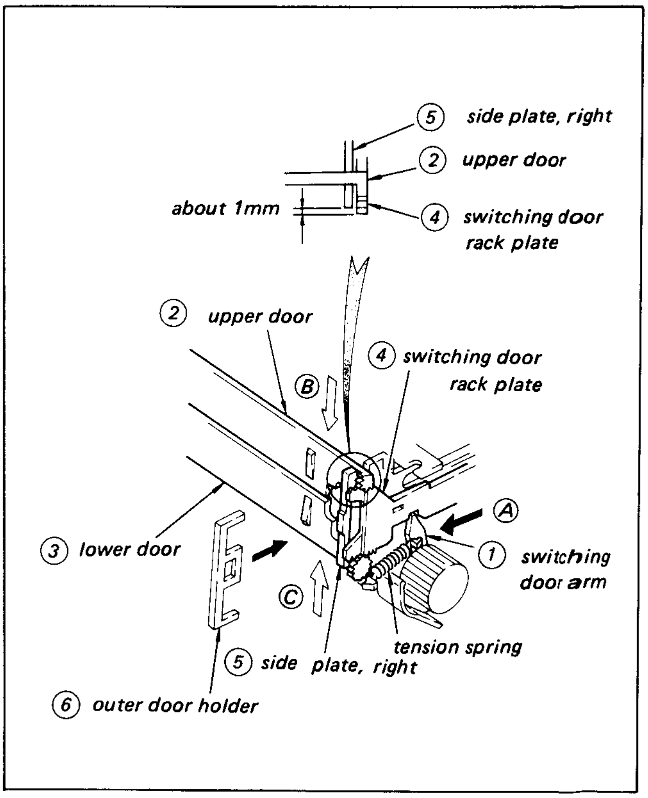

⑤ side plate, right
② upper door
about 1mm
④ switching door rack plate
② upper door
④ switching door rack plate
Ⓑ
Ⓐ
③ lower door
① switching door arm
Ⓒ
tension spring
⑤ side plate, right
⑥ outer door holder

*Fig. 3-17. Position Adjustment of Cassette Door Assembly*

### 3-7-5. Position Matching of Right Worm Wheel of FL Cassette Compartment Assembly

In the FL cassette compartment assembly, the cassette holder feed rate is determined using a worm wheel system so that the cassette holder always moves parallel to the mechanism chassis. Therefore, cassette feeding cannot be performed properly unless the worm wheel gearing position is properly adjusted during subsequent assembly once gearing of this section has been moved from the normal position.

**[Gear Positioning]**

1) Prepare a rod about 1.5 mm thick and 200 mm long.
2) Pass the rod through the hole in the side plate, right and left (Perform on left and right sides.)
3) Insert the assembly comprising the driving arm, right ① and cassette-on cam ② on the positioning rod and assemble it on the right of the side plate, ③. Similarly assemble the driving arm, on the left of the side plate.
4) Insert the worm wheel ④ through the positioning rod as described in 3) above and assemble it on the right of the side plate ③.
5) Insert the assembly comprising the limiter gear ⑤ and cassette-off cam ⑥ on the positioning rod as in 3) and 4) above and assemble it on the right of the side plate ③.
6) After assembling, pull the rod out from the right side.

**Note:**
If a rod is not available, the holes can be lined up by eye.

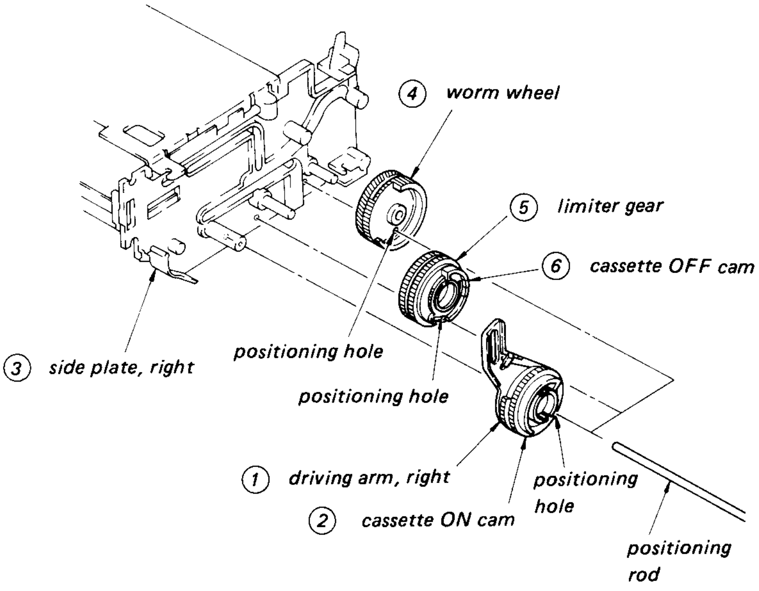

④ worm wheel
⑤ limiter gear
⑥ cassette OFF cam
③ side plate, right
positioning hole
positioning hole
① driving arm, right
② cassette ON cam
positioning hole
positioning rod

*Fig. 3-18. Positioning of FL Cassette Compartment Worm Wheel*

## 3-8. REMOVAL OF REEL BLOCK

1) Remove four screws ①.
2) Remove the reel block ②.

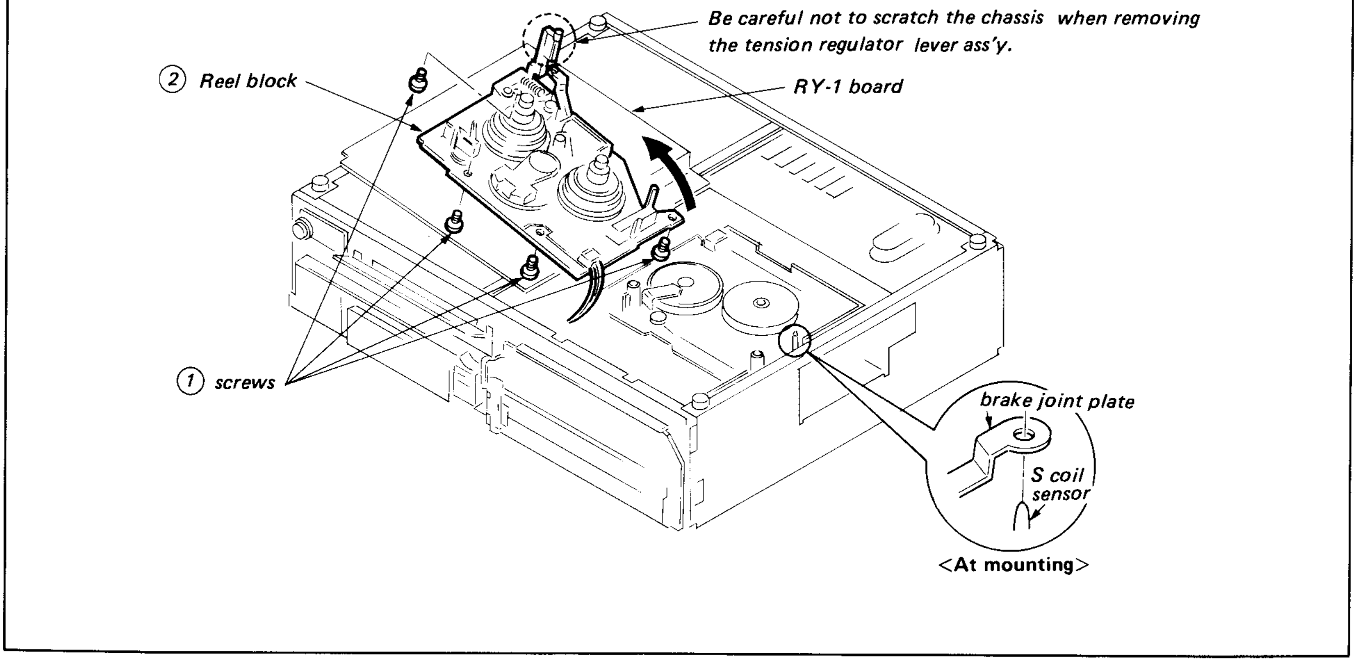

② Reel block
① screws
Be careful not to scratch the chassis when removing the tension regulator lever ass'y.
RY-1 board
brake joint plate
S coil sensor
<At mounting>

Fig. 3-19. Dismounting Reel Block

## 3-9. UNTHREADING CHECK

1) Press the EJECT button and unthread.
2) Check that the actuator for the unthreading end switch is not tripped as shown in Fig. 3-20. (Slowly rotate the internal gear by hand and verify by the click sound.)
   * Refer to Paragraph 1-3-2 to thread manually.
   Adjust according to Paragraph 3-15-2 if necessary.

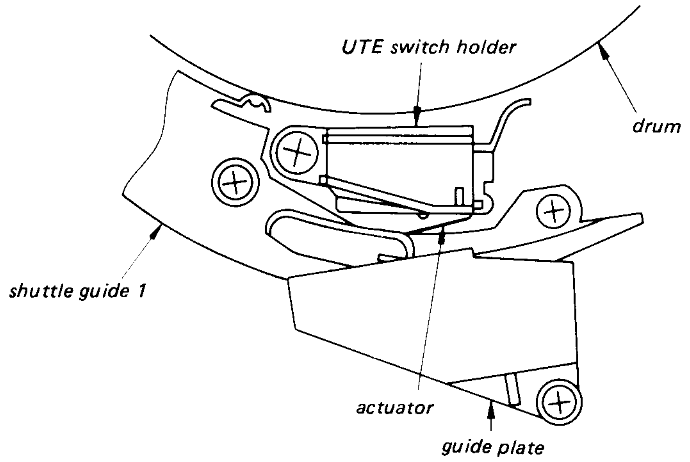

UTE switch holder
drum
shuttle guide 1
actuator
guide plate

Fig. 3-20. UTE Switch

## 3-10. S THREADING RING REPLACEMENT AND ADJUSTMENT

### 3-10-1. Preparation for Removal of S Threading Ring

Remove ACE assembly, FE Head and Threading Motor. (Fig. 3-21)

1) Unscrew the Phillips head continuous-thread stepped screw ①.
2) Remove the No. 6 guide nut ②, washer ③, spacer ④ and compression coil spring ⑤. Use a special notched screwdriver. (See Section 1-4, Tools And Fixtures Required)
3) Remove the two guide adjusting nuts ⑥ and the ACE assembly and FE head.

**Caution:**
ACE assembly and FE head are connected by a lead. Be careful when removing them. The compression coil spring underneath the ACE assembly does not have to be removed. However, be careful not to lose it.

4) Unscrew two screws ⑦ and remove the STOPPER ARM ASSEMBLY BLOCK ⑧.
5) Unscrew the two screws ⑨ and pull the threading motor assembly up to remove.

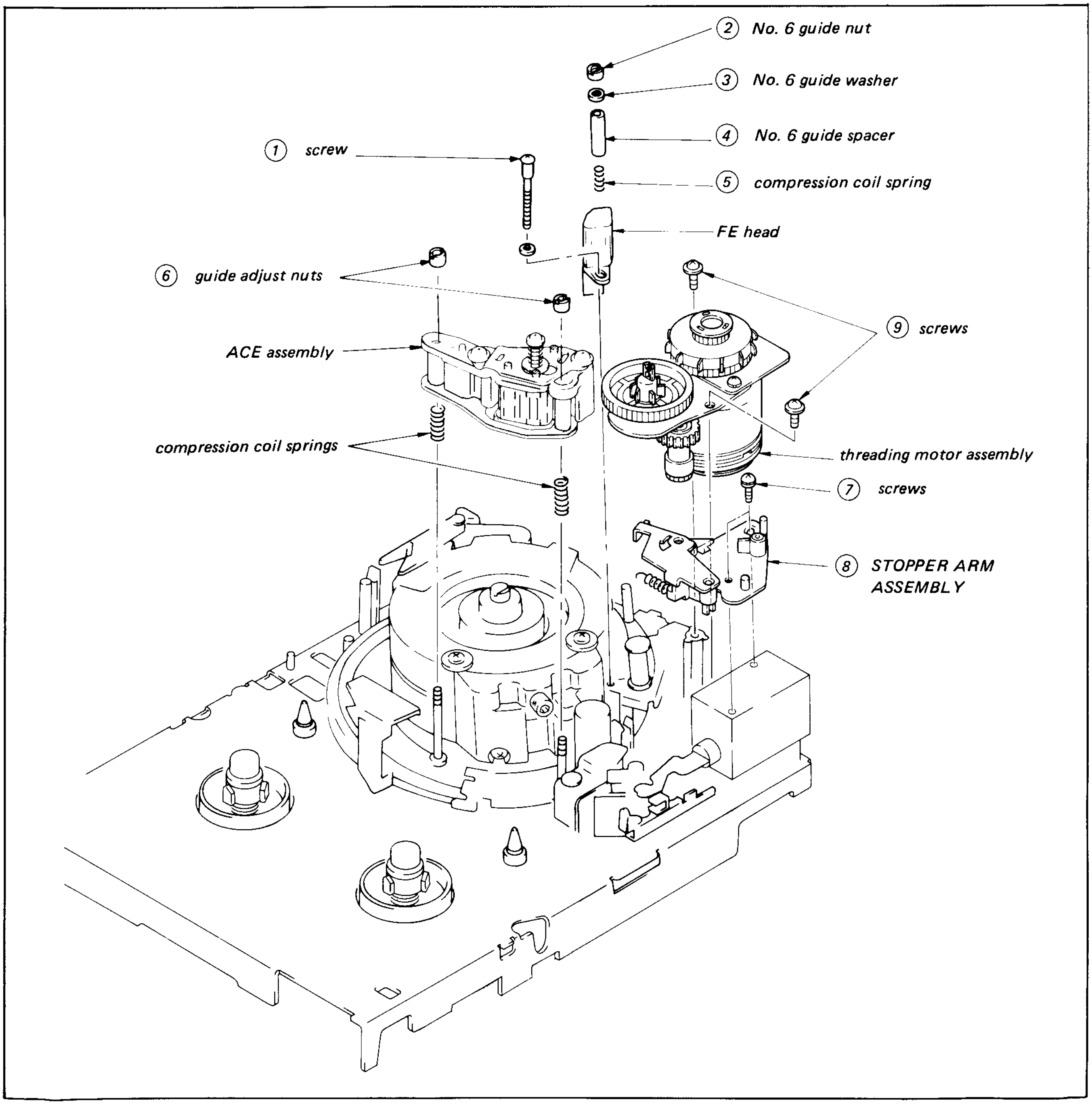

② No. 6 guide nut
③ No. 6 guide washer
④ No. 6 guide spacer
① screw
⑤ compression coil spring
FE head
⑥ guide adjust nuts
⑨ screws
ACE assembly
compression coil springs
threading motor assembly
⑦ screws
⑧ STOPPER ARM ASSEMBLY

*Fig. 3-21. Dismounting ACE Assembly, FE Head, and Threading Motor*

**[Removal of Other Parts] (Fig. 3-22)**

1) Measure the gap between the upper drum and adjust the plate as for replacement of the drum assembly. (Fig. 3-5)
2) Unscrew the two screws ① and remove the tape guide ground plate ② and adjust plate ③.
3) Unscrew the two screws ④ and remove the tape holder assembly ⑤
4) Unscrew screw ⑥ and remove the guide plate ⑦
5) Unscrew the two screws ⑧ and five screws ⑨ to remove the shuttle guide (1-YA) ⑩ and (2) ⑪ as well as the slant base assembly ⑫
6) Unscrew screw ⑬ and remove the pin link liner plate ⑭

**Caution:**

When the guide plate is removed, do not thread or unthread with the shuttle guide mounted.

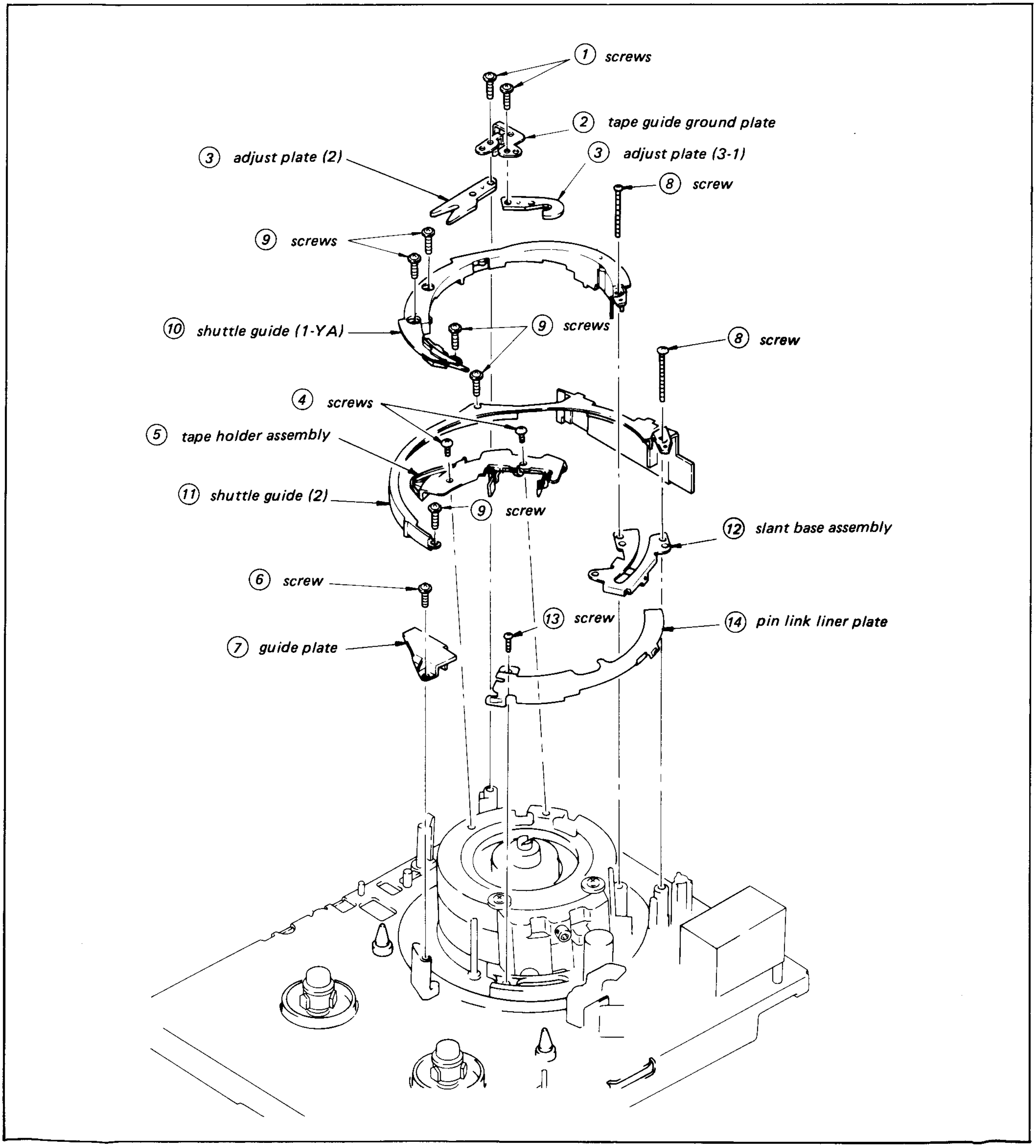

① screws
② tape guide ground plate
③ adjust plate (2)
③ adjust plate (3-1)
⑧ screw
⑨ screws
⑩ shuttle guide (1-YA)
⑨ screws
⑧ screw
④ screws
⑤ tape holder assembly
⑪ shuttle guide (2)
⑨ screw
⑫ slant base assembly
⑥ screw
⑬ screw
⑭ pin link liner plate
⑦ guide plate

Fig. 3-22. Removing Other Parts

### 3-10-2. Removal of S Threading Ring (Fig. 3-23)

1) Remove the spring of the lock arm assembly. (Refer to Paragraph 3-15-1, Fig. 3-33)
2) Remove stop washers ① and ring rollers ②, ③.
3) Remove the UTE switch subassembly. (Refer to Paragraph 3-15-2, Fig. 3-34)
4) Unscrew screw ④ and remove the ring roller adjustment plate ⑤ and ring roller ⑥.
5) Remove the S threading ring ⑦.

**Caution:**
Do not use the same washer twice.

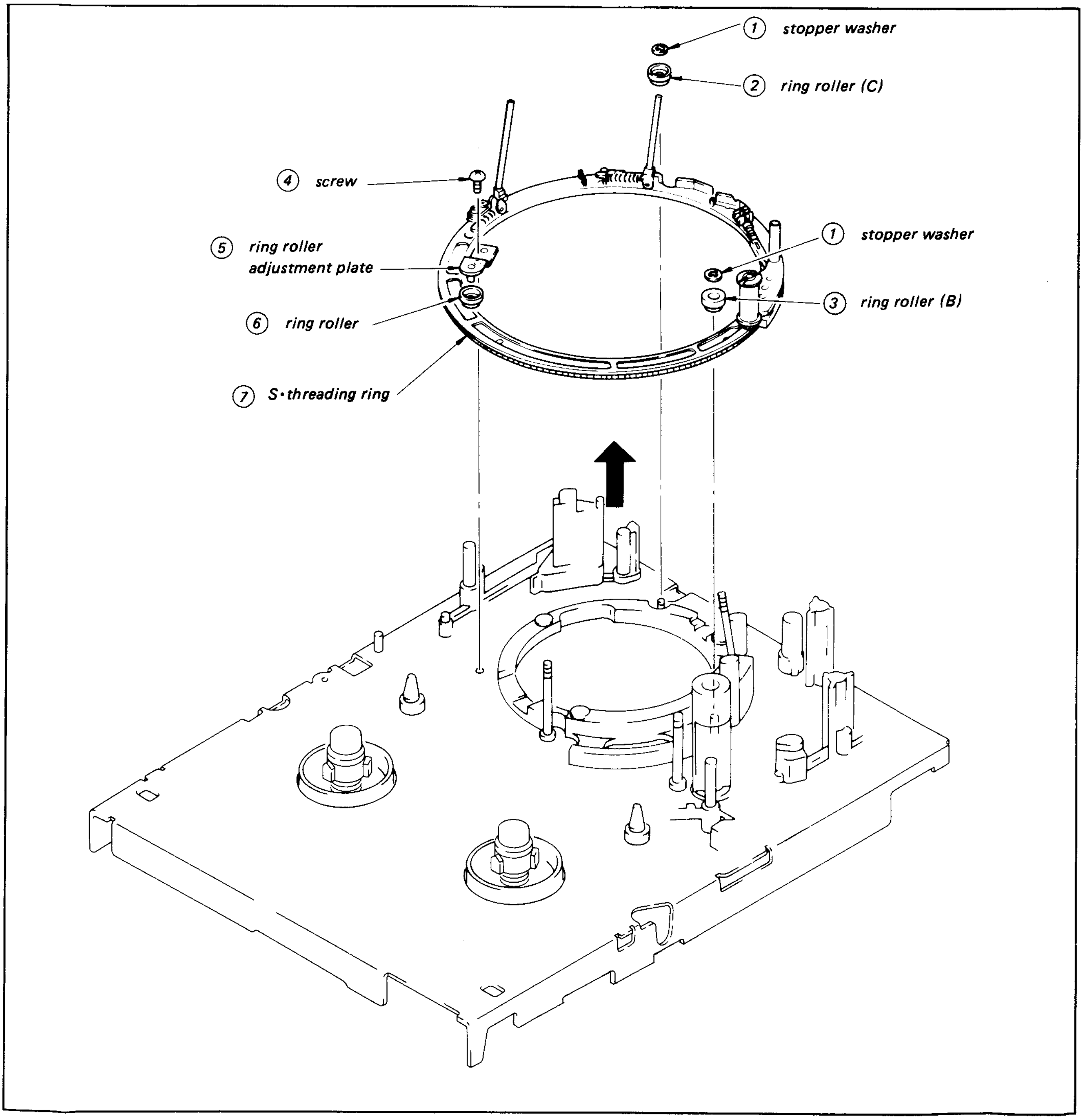
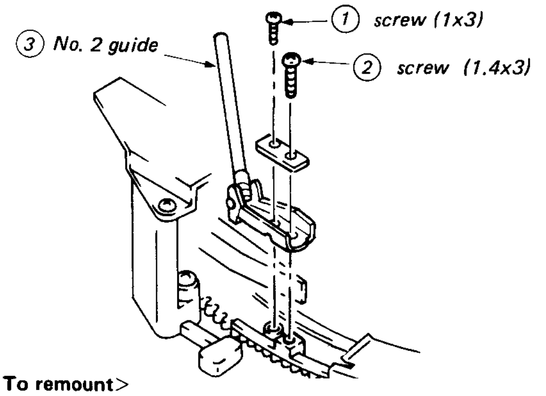

① stopper washer
② ring roller (C)
④ screw
① stopper washer
⑤ ring roller adjustment plate
③ ring roller (B)
⑥ ring roller
⑦ S•threading ring

*Fig. 3-23. Removing S Threading Ring*

### 3-10-3. Removal of No. 2 Guide

1) Unscrew the screw (1×3) ①.
2) Unscrew the screw (1.4×3) ②.
3) Remove the No. 2 guide ③.


③ No. 2 guide
① screw (1x3)
② screw (1.4x3)

**<To remount>**

*1) Loosely tighten the 1 x 3 tap-in screw.*
*2) Tighten the 1.4 x 3 tap-in screw all the way.*
*3) Adjust the 1 x 3 tap-in screw until the height is 35 mm. After adjustment, lock the screw.*
*Note: The no. 3 guide is up all the way.*

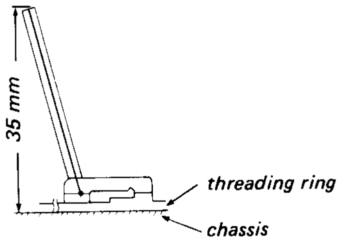
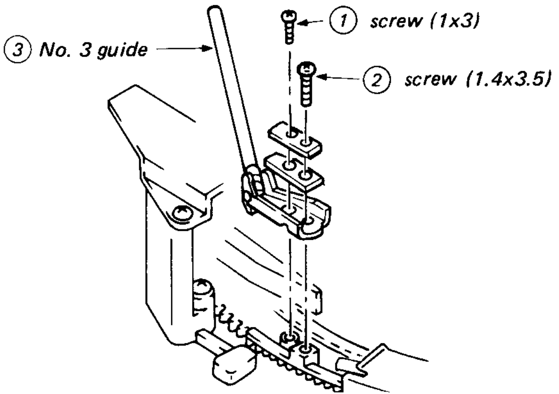

35 mm
threading ring
chassis

*Fig. 3-24. Removal of No. 2 Guide*

### 3-10-4. Removal of No. 3 Guide

1) Unscrew the screw (1×3) ①.
2) Unscrew the screw (1.4×3.5) ②.
3) Remove the No. 3 guide ③.


③ No. 3 guide
① screw (1x3)
② screw (1.4x3.5)

**<To remount>**

*1) Loosely tighten the 1 x 3 tap-in screw.*
*2) Tighten the 1.4 x 3.5 tap-in screw all the way.*
*3) Adjust the 1 x 3 tap-in screw so that the height is 30 mm. After adjustment, lock the screw.*
*Note: The no. 2 guide is up all the way.*

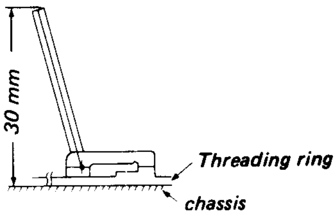

30 mm
Threading ring
chassis

*Fig. 3-25. Removal of No. 3 Guide*

### 3-10-5. Checking Slider Stopper Mounting (Fig. 3-26)

1) Check that the drive gear is engaged.
2) Loosen screw ①, insert a spacer ($t = 0.2$) between the slider gear and slider stopper, then tighten screw ① while pushing in the directions of arrows Ⓐ and Ⓑ

**Caution:**
Make sure to push it in direcition Ⓐ to eliminate any play. The slider stopper rotates in the direction of arrow Ⓒ when screw ① is tightened. Therefore, tighten the screw while holding it with a blade-tip screwdriver.

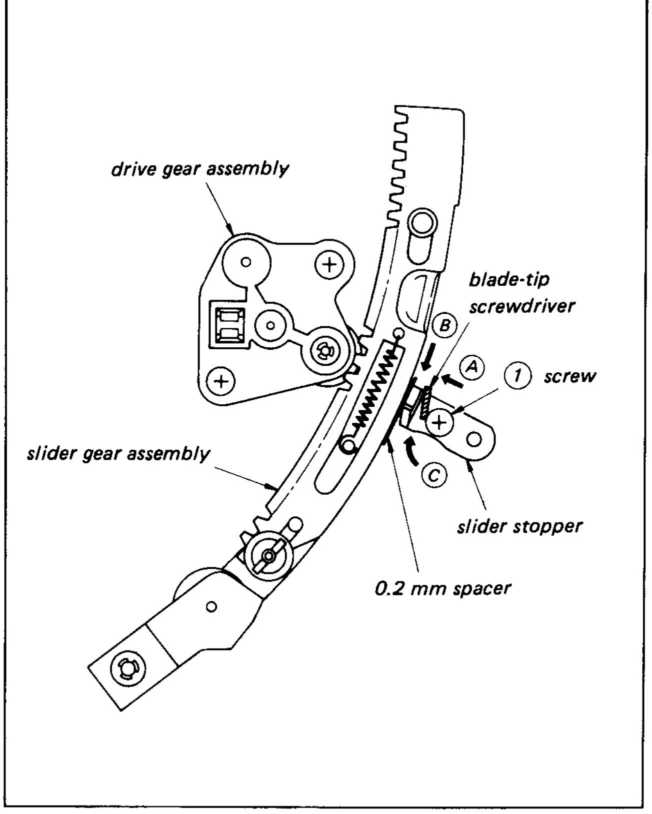

drive gear assembly
blade-tip screwdriver
Ⓑ
Ⓐ
① screw
slider gear assembly
Ⓒ
slider stopper
0.2 mm spacer

*Fig. 3-26. Mounting Slider Stopper*

### 3-10-6. Replacement of S Threading Ring (Fig. 3-27)

1) Mount the S threading ring.
2) Set the slider gear assembly in the unthreading complete position.
   (Insert a 0.5 mm spacer between the slider stopper and slider gear as shown in Section Ⓐ .)
3) Rotate the S threading ring in the direction of the arrow ⓐ and align the mechanism chassis hole (φ3) and S threading ring hole (φ1.5) of the section Ⓑ .
4) Mesh the drive gear assembly with the S threading ring and fit them into the mechanism chassis.
5) Reassemble after repositioning the gearing of the drive gear assembly and S threading ring gear if the hole positions do not match.

**Note:**
Adjust the ACE assembly in accordance with Section 4 for tape path adjustment after changing and mounting the S threading ring.

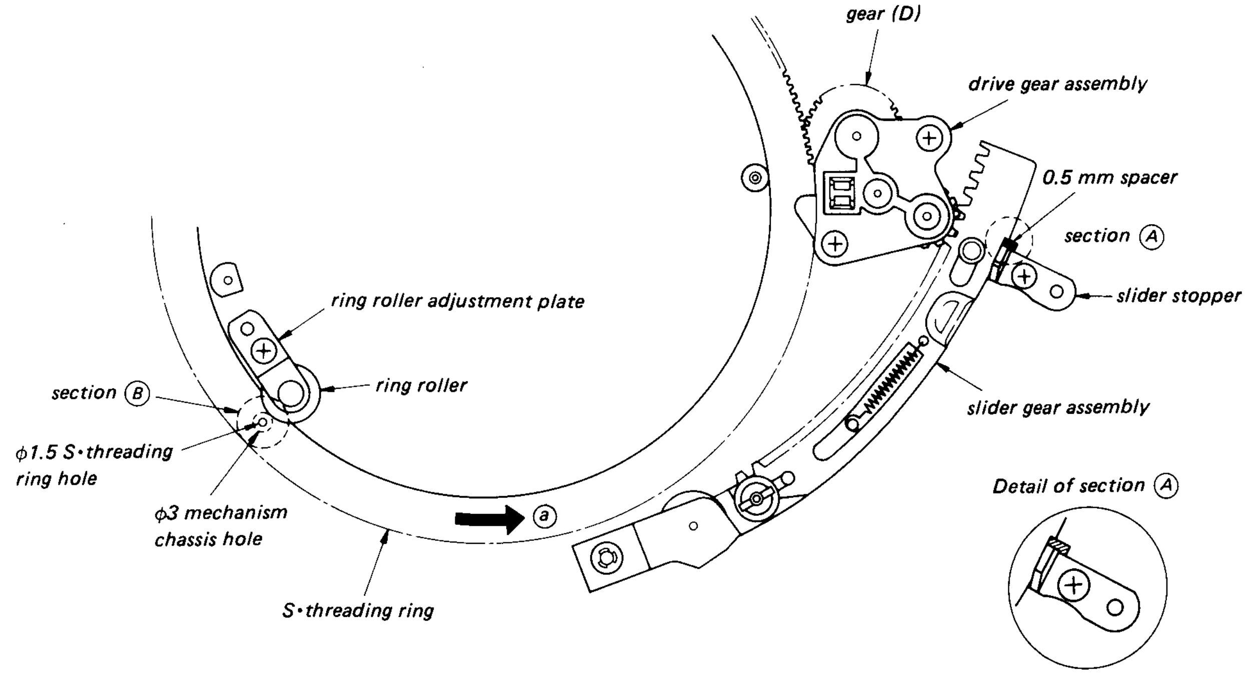

gear (D)
drive gear assembly
0.5 mm spacer
section Ⓐ
slider stopper
ring roller adjustment plate
ring roller
section Ⓑ
φ1.5 S·threading ring hole
φ3 mechanism chassis hole
ⓐ
S·threading ring
slider gear assembly
Detail of section Ⓐ

*Fig. 3-27. S threading Ring Position Adjustment*

## 3-11. CHECK AND ADJUSTMENT OF PINCH PRESS LIMITER CLEARANCE

**[Check Procedure]**

1) Set up a threading completed state.
2) Check that the clearance "t" of the pinch press limiter in Fig. 3-28 is 0.4 — 0.6 mm. If not, adjust as follows:

**[Adjustment Procedure]**

1) Loosen screw ① in Fig. 3-28 with the pinch solenoid held in.
2) Move the pinch limiter adjust plate (shaded in the diagram) fully in the direction of arrow ⓐ. The clearance "t" at this time is 0.
3) Push the pinch limiter adjust plate in the direction of arrow ⓑ as shown at section Ⓐ using a blade-tip screwdriver, until the clearance "t" is 0.4 — 0.6 mm.
   (Use $\phi$0.4 and $\phi$0.6 gauges for clearance adjustment)
4) Tighten screw ① and lock it.

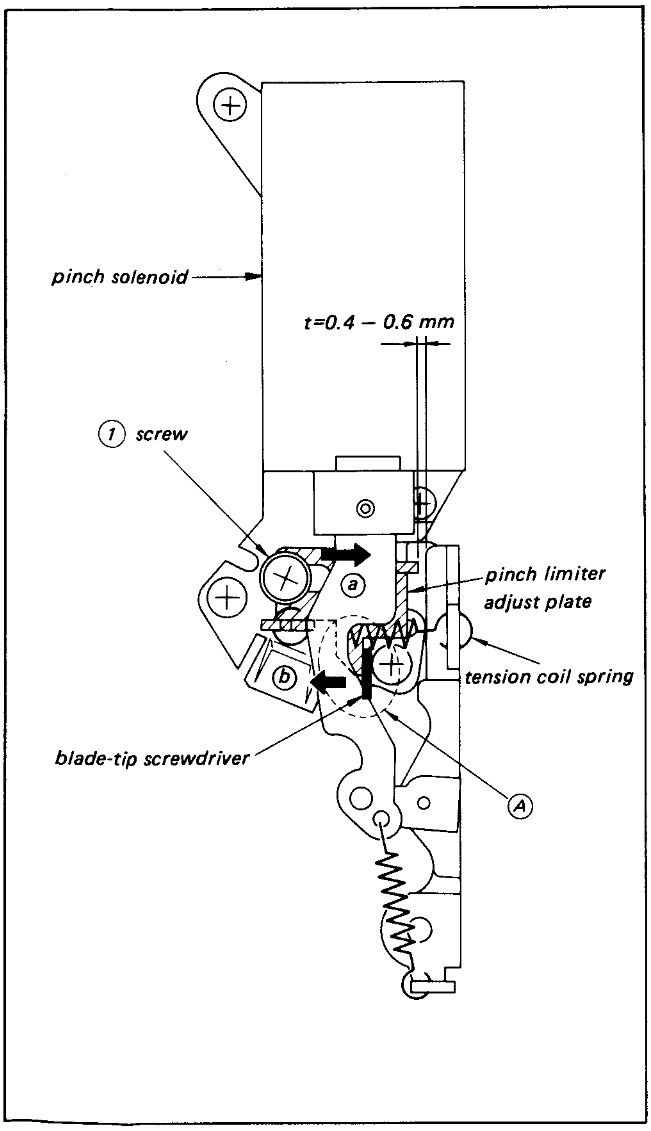

pinch solenoid
t=0.4 – 0.6 mm
① screw
ⓐ
pinch limiter adjust plate
ⓑ
tension coil spring
blade-tip screwdriver
Ⓐ

Fig. 3-28. Pinch Press Limiter Clearance Adjustment

## 3-12. BRAKE PLUNGER POSITION ADJUSTMENT

1) Loosen the screw ① securing the brake plunger.
2) Adjust the installation position so that the suction stroke of the brake plunger becomes 2 mm.
   When the plunger is in the sucked state, S brake should be separated from S reel table.

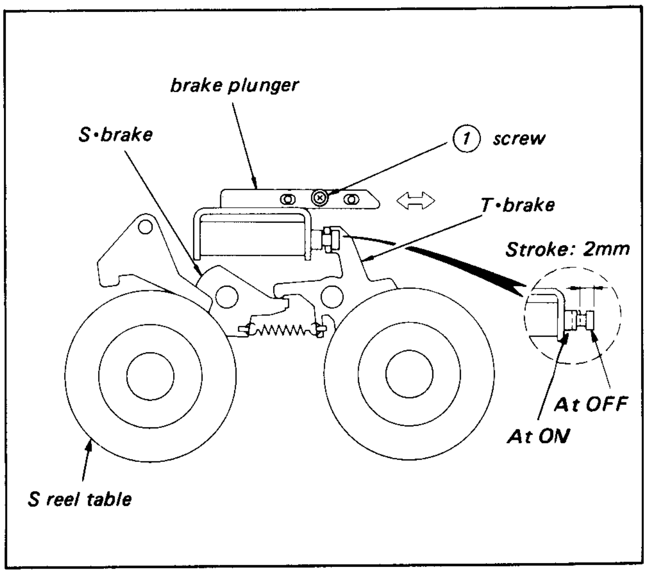

brake plunger
S·brake
① screw
T·brake
Stroke: 2mm
At OFF
At ON
S reel table

Fig. 3-29. Brake Plunger Position Adjustment

## 3-13. SOFT BRAKE ADJUSTMENT

**[Adjustment Method]**

1) Place a tension gauge (SL-0011) on the S reel base and hook a sector type gauge as shown in Fig. 3-30.
2) Adjust by moving the tension coil spring ① in the direction of the arrow Ⓐ until the sector type gauge reading is 8 g when the FF mode is set up. (See Fig. 3-31)

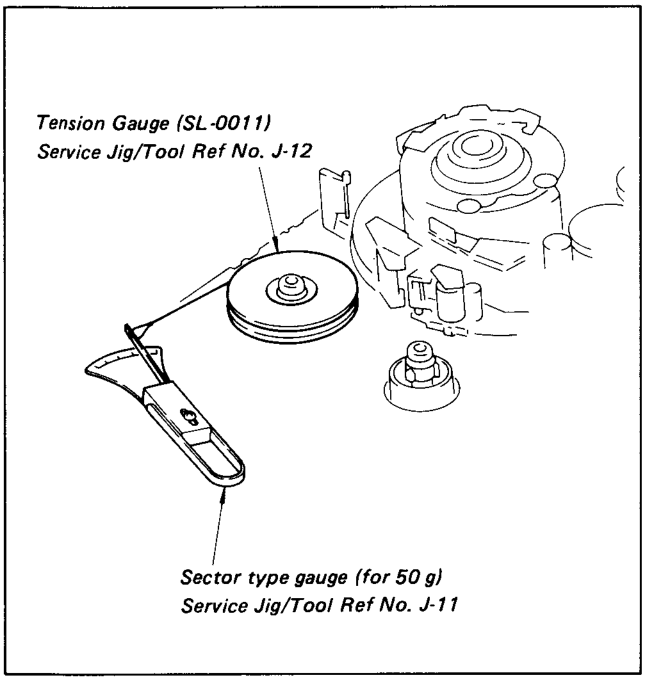

Tension Gauge (SL-0011)
Service Jig/Tool Ref No. J-12
Sector type gauge (for 50 g)
Service Jig/Tool Ref No. J-11

*Fig. 3-30. Soft Brake Adjustment-1*

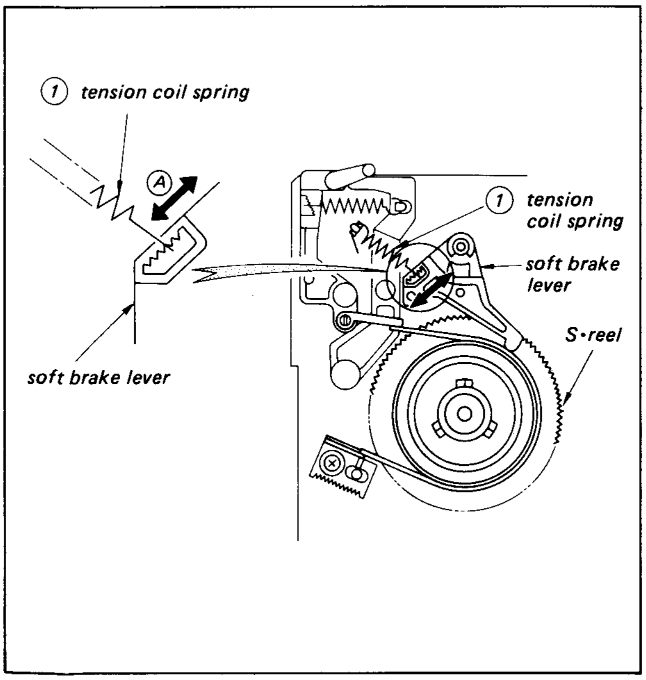

① tension coil spring
Ⓐ
soft brake lever
① tension coil spring
soft brake lever
S•reel

*Fig. 3-31. Soft Brake Adjustment-2*

## 3-14. TENSION REGULATOR LEVER POSITION ADJUSTMENT

**[Adjustment Method]**

1) Set up the PLAY Mode.
2) Loosen the screw ③ and adjust by moving the tension regulator band assembly ④ in the direction of the arrow Ⓐ until the tape guide pin (No. 1 guide) of the tension regulator lever assembly ① is positioned inside the outer circumference of the shuttle guide (2) ② as shown in Fig. 3-32.
3) After making the adjustment, tighten the screw ③ carefully in order not to move the tension regulator band assembly ④.

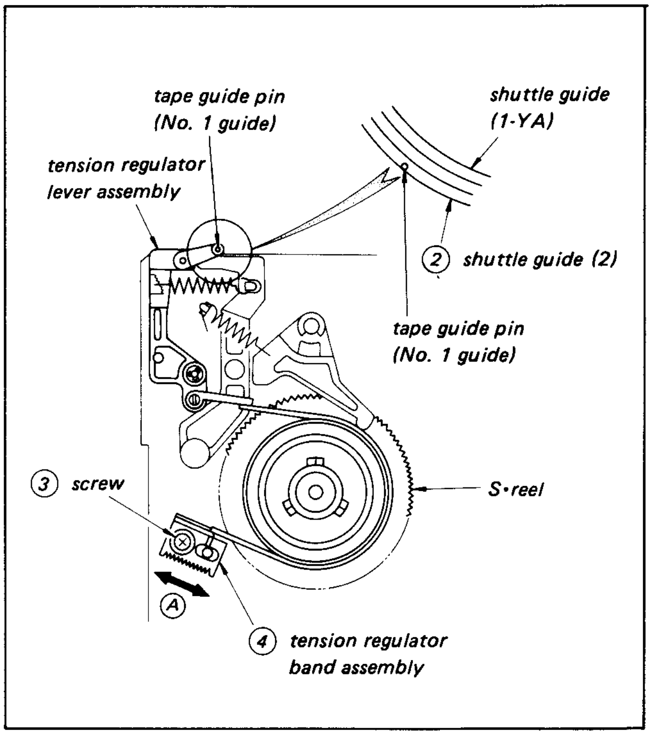

tape guide pin
(No. 1 guide)
shuttle guide
(1-YA)
tension regulator
lever assembly
② shuttle guide (2)
tape guide pin
(No. 1 guide)
③ screw
S•reel
Ⓐ
④ tension regulator
band assembly

*Fig. 3-32. Tension Regulator Lever Position Adjustment*

## 3-15. CHECK AND ADJUSTMENT OF MICROSWITCH POSITION

### 3-15-1. Check and Adjustment of Threading End Switch (TE Switch) Position

**[Check Procedure] (Fig. 3-33)**

Rotate the S threading ring by hand and check that the TE switch turns on and off with a clicking noise while the lock roller is moving within the upper 2/3 of the straight portion ℓ of the recess Ⓐ in Fig. 3-33 on the ring. If not, adjust as follows.

**[Adjustment Procedure]**

1) Adjust the lock roller to the position caving from the notch rim tip on the S threading ring, rotate the cam shaft using a blade-tip screwdriver in the direction of the arrow, and secure the cam shaft when the TE switch is turned on (a click tone is audible).
2) Check the results of the adjustment following the check procedure above.

**[Removal] (Fig. 3-34)**

1) Unhook the tension coil spring from the lock arm assembly.
2) Unscrew screw ① and remove the TE switch subassembly.
3) Push the hook on the main chassis assembly in the direction of the arrow to unhook, and remove the lock arm assembly.

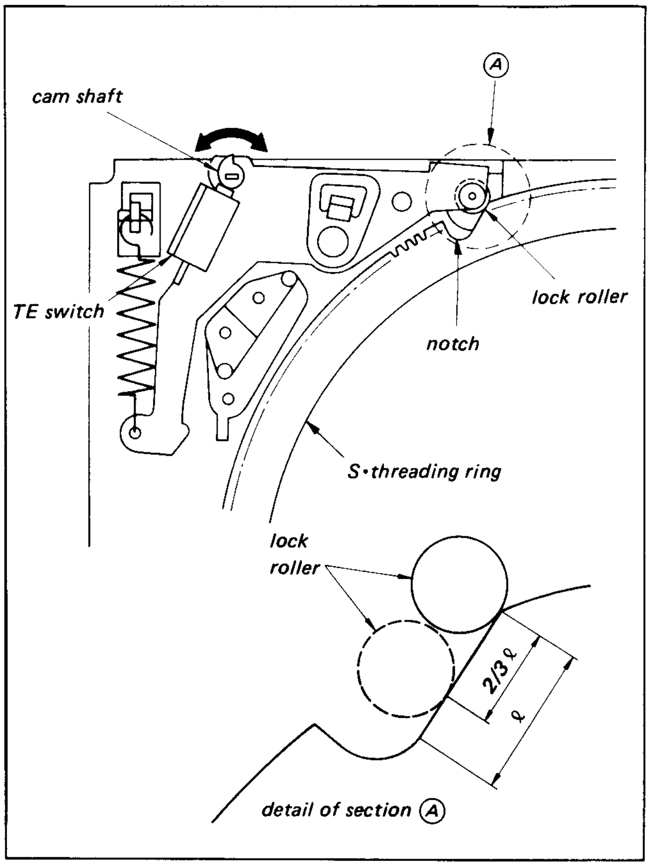

Ⓐ
cam shaft
TE switch
lock roller
notch
S•threading ring
lock roller
2/3ℓ
ℓ
detail of section Ⓐ

*Fig. 3-33. TE Switch Position Adjustment*

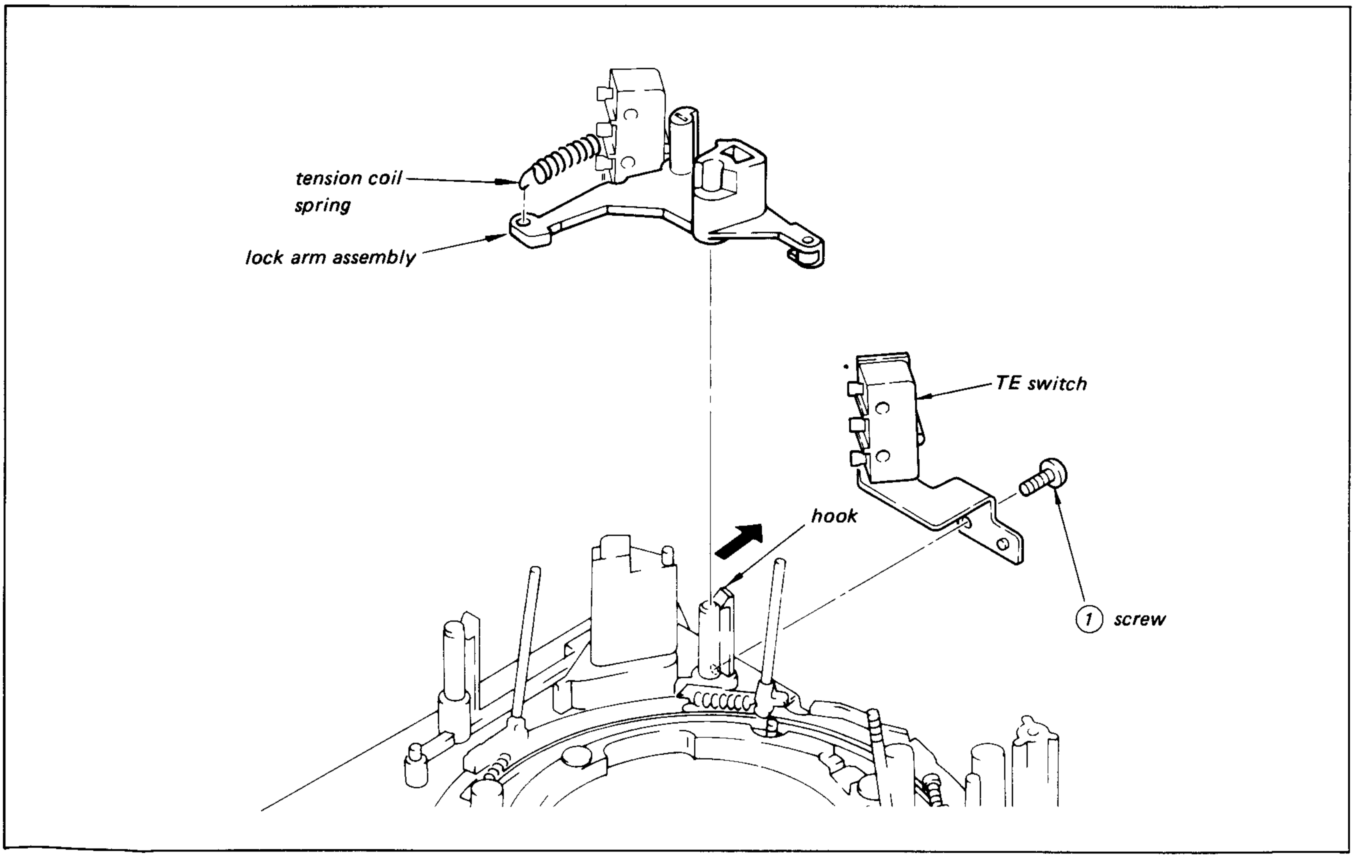

tension coil spring
lock arm assembly
TE switch
hook
① screw

*Fig. 3-34. Removing TE Switch and Lock Arm Assembly*

### 3-15-2. Check and Adjustment of Unthreading End Switch (UTE Switch) Position

**[Check Procedure]**

Rotate the S threading ring by hand. Verify that the switch trips when a pin of $\phi 1.2$ is inserted at section Ⓐ in Fig. 3-35 after the UTE switch arm roller assembly has dripped into the UTE switch cam groove. Verify that the switch does not trip when a pin of $\phi 0.6$ is inserted.

**[Adjustment Procedure]**

1) If the switch does not trip when the $\phi 1.2$ pin is inserted, loosen small screw ① and adjust by moving in the direction of the arrow little by little.
2) The switch actuator is bent as shown in Fig. 3-36 when the switch turns on after inserting a $\phi 0.6$ pin.
   Check the adjustment.

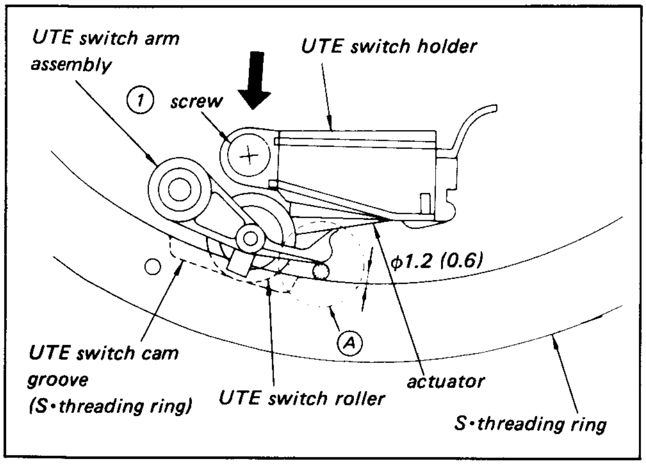

UTE switch arm assembly
① screw
UTE switch holder
$\phi 1.2$ (0.6)
Ⓐ
UTE switch cam groove (S·threading ring)
UTE switch roller
actuator
S·threading ring

*Fig. 3-35. UTE Switch Position Adjustment*

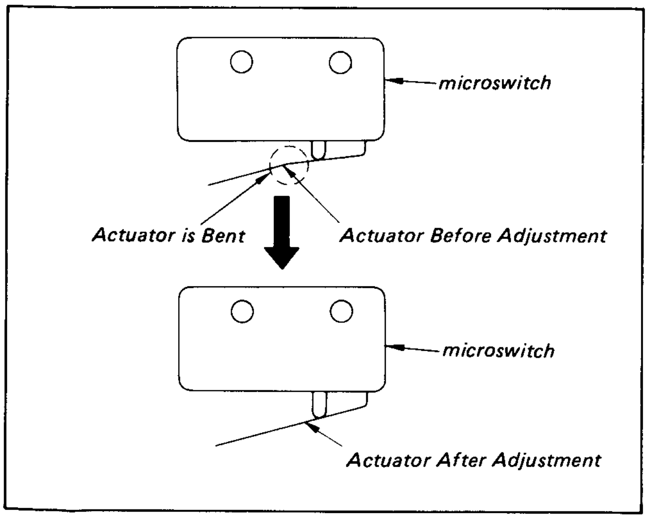

microswitch
Actuator is Bent
Actuator Before Adjustment
microswitch
Actuator After Adjustment

*Fig. 3-36. Actuator Adjustment*

**Caution:**

Insert the $\phi 1.2$ and 0.6 pins into their correct positins as shown in Fig. 3-37. (Even when the clearance at the entrance is 1.2 mm on construction, depending on the pin insertion positions as shown in Fig. 3-37, the clearance inside is less than 1.2 mm).

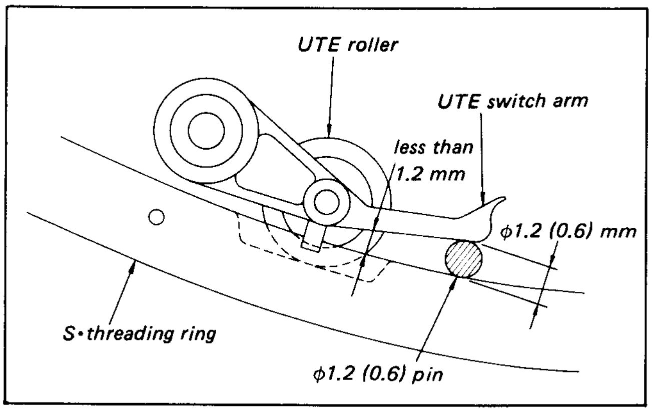

UTE roller
UTE switch arm
less than 1.2 mm
$\phi 1.2$ (0.6) mm
S·threading ring
$\phi 1.2$ (0.6) pin

*Fig. 3-37. Pin Position During Checking*

**[Removal]**

1) Unscrew screw ① as shown in Fig. 3-38.
2) Release the switch hook ② from the chassis and remove the switch body while pushing the actuator to the "ON" position.

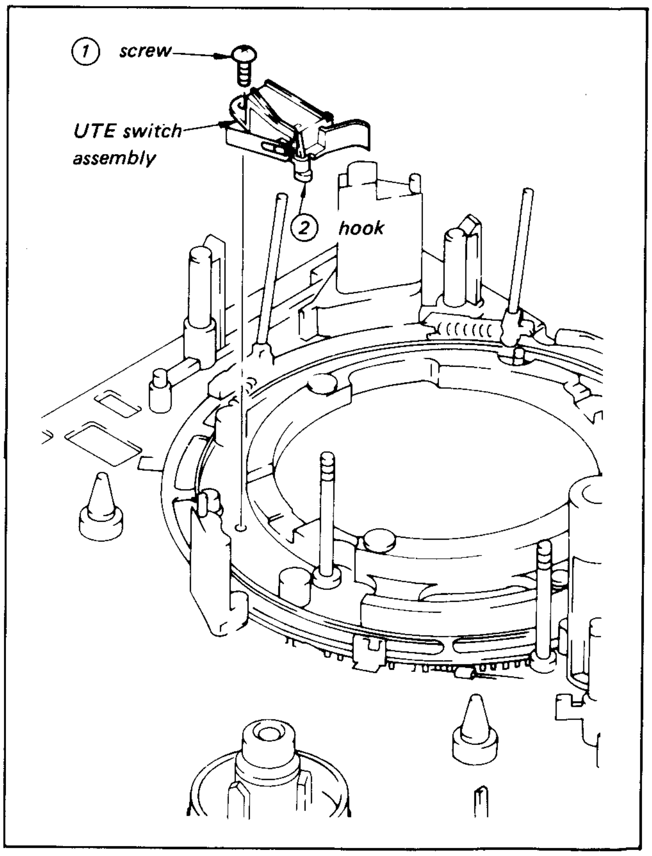

① screw
UTE switch assembly
② hook

*Fig. 3-38. Removing UTE Switch*

## 3-16. FORWARD/BACK TENSION MEASUREMENT

Perform this measurement using torque cassette SL-0003C according to the procedure below.

**[Procedure]**

1) Remove the upper panel so that the tape path is visible.
2) Insert the torque cassette and set PLAY mode.
3) Read the S reel side meter after the indicator has made about one revolution.
   Specified Value 30 ± 5 g • cm

**Note:**

i) Be sure the set is level when measuring.
ii) After measuring, the tape may go slack if the STOP button is pressed, so put the set into forward mode first, to remove the slack, then the tape can be ejected.

**[Adjustment]**

Adjust the position of the tension coil spring on the tension regulator lever assembly in the direction of the arrow Ⓐ so that measured values become 30 ± 5 g • cm to conform to the standard.

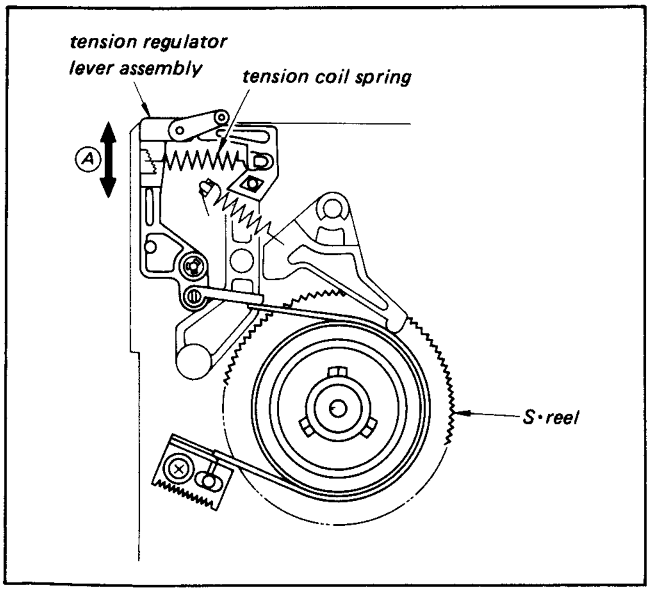


*Fig. 3-39. Back Tension Measurement*

## 3-17. FORWARD TORQUE ADJUSTMENT

Perform this measurement using torque cassette SL-0003C according to the procedure below.

**[Procedure]**

1) Insert the torque cassette and set RECORD mode.
2) Adjust RV309 of SS-16 board so that the reading of the take-up side becomes 80 ± 5 g • cm.

**Note:**

Upon RECORD mode, auto shutoff may occur, entering STOP mode. This is due to the construction of the torque cassette (the action of the built-in spring). The spring acts when the take-up reel table stops momentarily. In this case, either readjust by pushing the REC button, or adjust as follows.

1. Unplug connectors CN310 and 311 from SS-16 board.
2. Connect pin ㊴ of IC301 (TP-402) and pin ② of CN 310 with a 47 kohm resister.
3. Adjust.

# SECTION 4
# TAPE PATH ADJUSTMENT

## 4-1. TRACKING ADJUSTMENT

This adjustment has significant effect on picture quality in each mode and tape interchangeability, so please perform it very carefully.

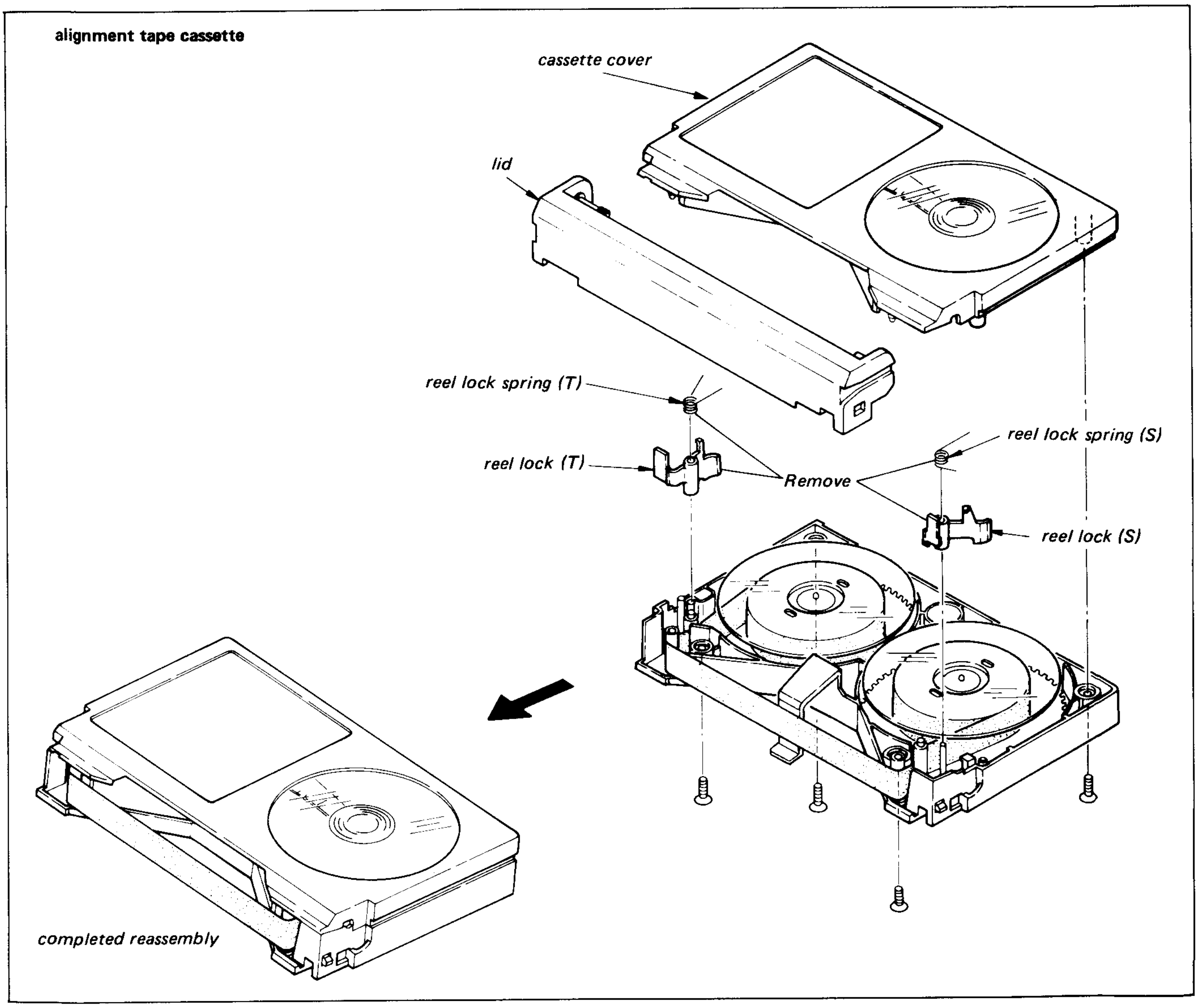
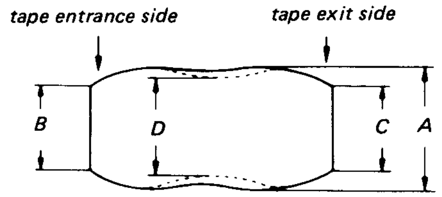

alignment tape cassette
cassette cover
lid
reel lock spring (T)
reel lock (T)
Remove
reel lock spring (S)
reel lock (S)
completed reassembly

*Fig. 4-1. Cassette Holder Remodeling*

### 4-1-1. Preparation

1) When modifying alignment tape KR5-2H, use caution not to dislodge the tape reels from their correct position. Refer to Fig. 4-1 and remove the four screws that secure the upper cover to the lower cover.
   Remove the upper cover and lid. Separate the lid and lid tension spring from the upper cover. Remove the two reel lock springs (T and S) and the two reel locks (T and S). Remount only the upper cover, being certain that it is properly mated with the lower cover. Secure the covers with four screws. NOTE — If the reel locks, and related springs are not removed from the cassette, the tape will load but will not thread. In this case the cassette will be ejected from the VCR approximately eight seconds after being loaded into the VCR.
2) Clean the tape contact surfaces (tape guides, drum, capstan shaft, pinch roller, ACE FE head surface) with chamois dampened with methanol.
3) Oscilloscope connections:
   1ch: CN2-5 pin (RY-1 board)
   2ch: CN2-3 pin (RY-1 board)
4) Play back the tracking portion of the modified KR5-2H alignment tape.
5) Confirm that the RF output waveform is flat, with maximum amplitude. (The waveform should increase and decrease, remaining flat, when the tracking control knob is turned back and forth.) Also, when the waveform is maximum, confirm that the RF output waveform variation and contact satisfy the specifications shown in Fig. 4-2. If they do not, follow the instructions in 6).
6) If the tracking control knob is turned and the entrance waveform does not flatten as shown in Fig. 4-3(a), perform the entrance side adjustment in 4-1-2. If the exit waveform does not flatten as shown in Fig. 4-3(b), perform the exit side adjustment in 4-1-3.


tape entrance side
tape exit side
B
D
C
A

*Specifications: Tracking Control Knob at Maximum*

contact: $\frac{B}{A} \geq 0.7$

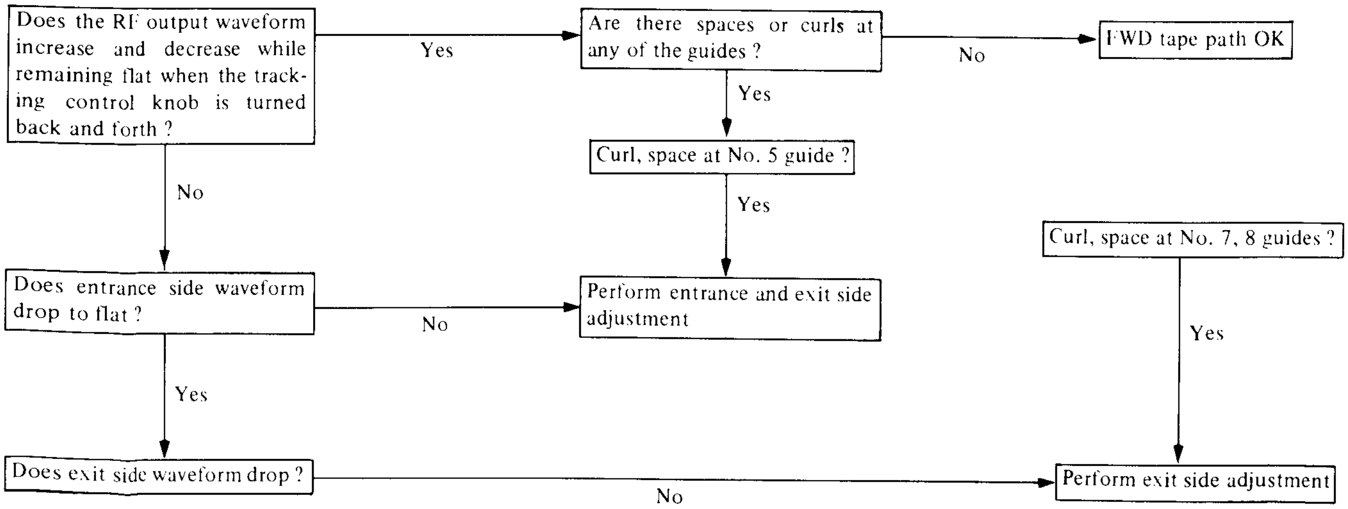
$\frac{C}{A} \geq 0.7$

Variation: $\frac{D}{A} \geq 0.9$

*Fig. 4-2.*

| | BOARD | CONNECTOR & PIN NO. |
|---|---|---|
| RF Output Waveform | RY-1 | CN2-5 |
| External Trigger | RY-1 | CN2-3 |
| Audio Out | AM-3 | CN501-1 |
| Video Out | YC-25 | VIDEO OUT |

**Waveform Confirmation**


Does the RF output waveform increase and decrease while remaining flat when the tracking control knob is turned back and forth ?
Yes
Are there spaces or curls at any of the guides ?
No
FWD tape path OK
Yes
Curl, space at No. 5 guide ?
Yes
No
Curl, space at No. 7, 8 guides ?
Does entrance side waveform drop to flat ?
No
Perform entrance and exit side adjustment
Yes
Yes
Does exit side waveform drop ?
No
Perform exit side adjustment

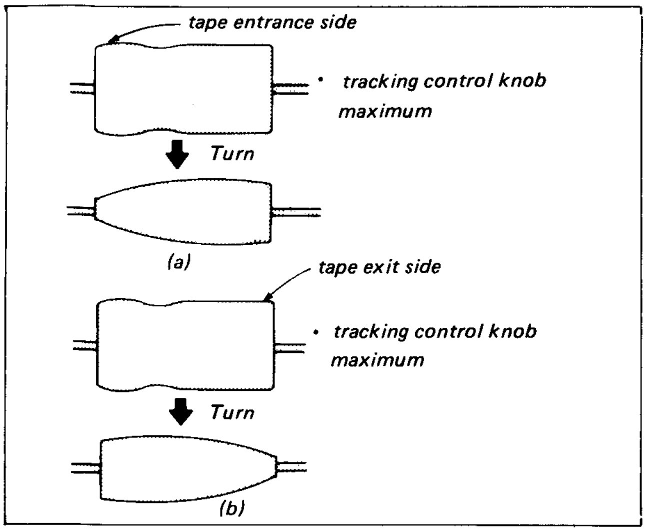

tape entrance side
• tracking control knob maximum
Turn
(a)
tape exit side
• tracking control knob maximum
Turn
(b)

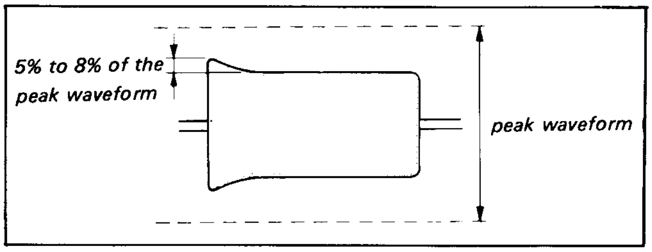
*Fig. 4-3.*

**Note:** After the indicated tape path adjustments that follow have been successfully completed using normal playback speed, operate the VCR in the Speed Search mode and look for curl at the tape guides. Readjust them if necessary. Then, finally, playback a regulator L830 tape as a check-up. See page 4-9.

### 4-1-2. Entrance Side Adjustment

Always perform the exit side adjustment as well as the entrance side adjustment. Fig. 4-4 illustrates the guides and adjustment locations.

1) Turn tracking control knob counterclockwise to drop RF output waveform to about 60% of maximum.
2) Turn No. 6 guide counterclockwise to free tape transportation to the drum. Use a special notched screwdriver. (See Section 1-4, Tools And Fixtures Required)
3) Loosen No. 5 guide lock screw ①, turn No. 5 guide so that the entrance side waveform is almost flat, as shown in the figure below, and tighten lock screw ①. (See Fig. 4-5)

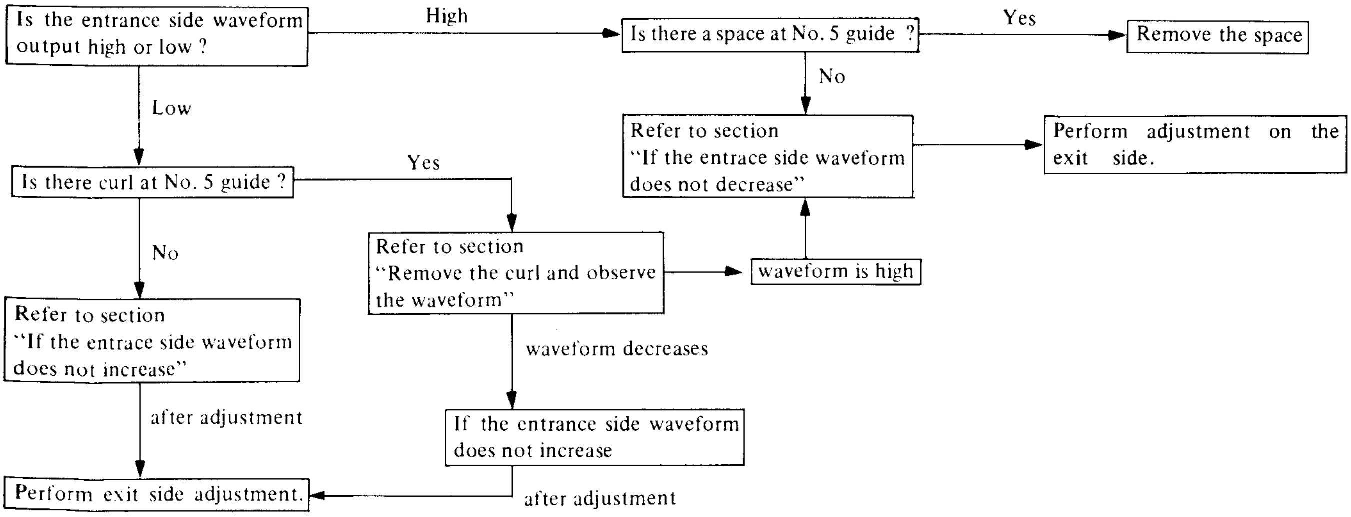

5% to 8% of the peak waveform
peak waveform

**Note:**
Be sure that the waveform remains as shown in the figure after tightening the lock screw ①.

4) Next lower No. 6 guide and flatten the waveform.
5) Push the tape down between No. 4 and No. 5 guides by hand, and confirm that the entrance side RF waveform returns to the original state after being lowered. If the waveform is not as illustrated, or if the waveform does not flatten, or takes too much time to flatten after the entrance side tape is pushed down, follow the procedure below to adjust.
6) Check No. 5 guide for space and curl. If space or curl exists, follow the appropriate adjustment procedure.

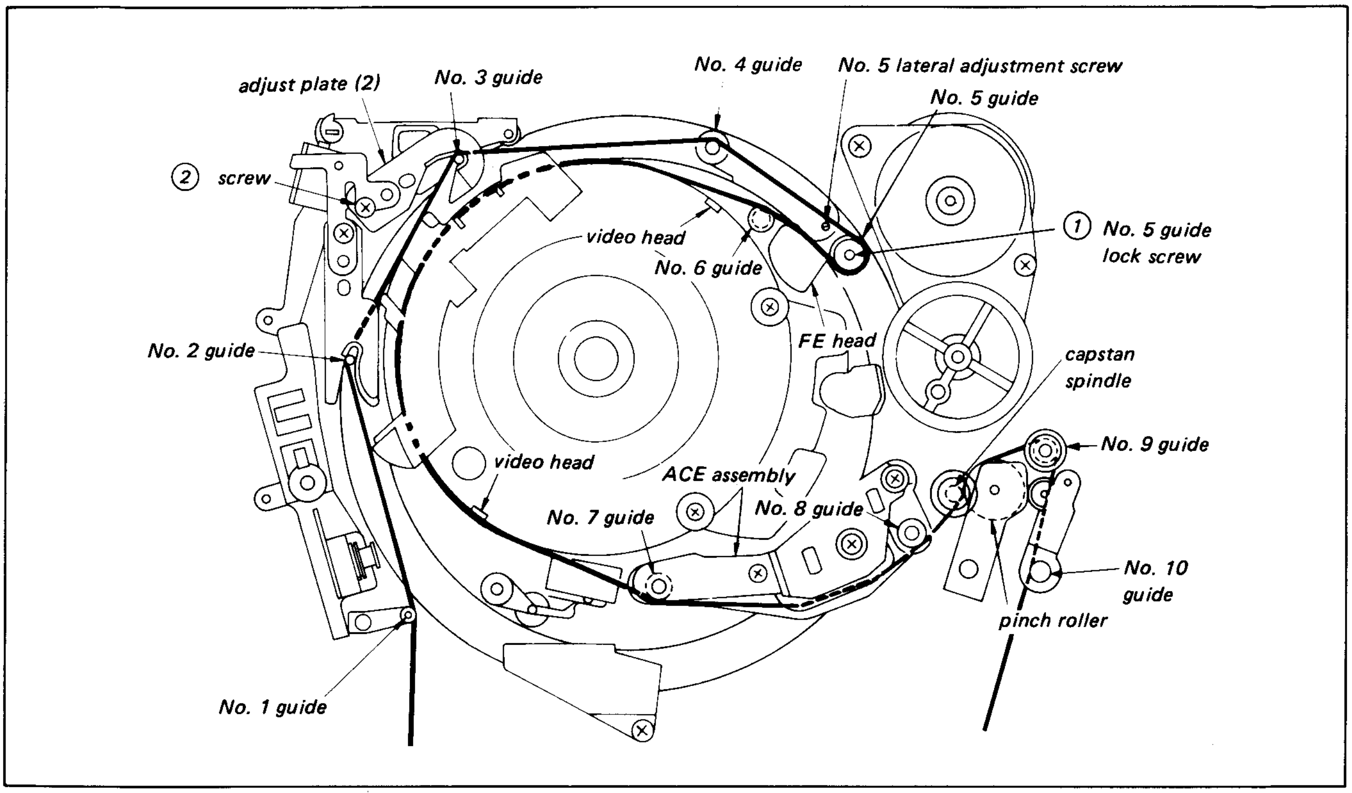
**Note:**
Be sure that there is tape tension upper and lower balance between No. 3 — No. 4 — No. 5 guides. Perform No. 3 or No. 5 guide lateral adjustment if necessary.

**Entrance Side Flow Chart**


Is the entrance side waveform output high or low ?
High
Is there a space at No. 5 guide ?
Yes
Remove the space
No
Low
Refer to section "If the entrace side waveform does not decrease"
Perform adjustment on the exit side.
Yes
Is there curl at No. 5 guide ?
No
Refer to section "Remove the curl and observe the waveform"
waveform is high
Refer to section "If the entrace side waveform does not increase"
waveform decreases
after adjustment
If the entrance side waveform does not increase
Perform exit side adjustment.
after adjustment

**Note:**

Upon failing to obtain the waveforms shown above, press down the tape at the entrance side, adjust as indicated below when a long time is needed for the waveform to return to the horizontal, or when it does not return at all.



adjust plate (2)
No. 3 guide
No. 4 guide
No. 5 lateral adjustment screw
No. 5 guide
② screw
video head
No. 6 guide
① No. 5 guide lock screw
No. 2 guide
FE head
capstan spindle
No. 9 guide
video head
ACE assembly
No. 7 guide
No. 8 guide
No. 10 guide
pinch roller
No. 1 guide

*Fig. 4-4. Tape Guide Layout*

**[If the waveform entrance output does not increase]**

1) Check to make sure tape upper and lower tension is equal between No. 3 — No. 4 — No. 5 guides. If it is not, perform No. 3 or No. 5 guide lateral adjustment.

   **Note:**
   Be sure there is no space at No. 4 guide lower flange.

2) Raise No. 4 guide lower flange to raise entrance output.

   **Note:**
   No. 4 guide lower flange may be raised 0.4 mm from its lowest position.

3) If the waveform does not increase in step 2), turn No. 5 lateral adjustment screw slightly (less then 360°) counter-clockwise.

**[If the waveform entrance output does not decrease]**

1) Move the No. 3 guide adjust plate away from the drum, and tighten screw ② at the point just before the lower tension of the tape loosens.
2) If the tape is touching No. 4 guide lower flange, lower the flange. If it is floating, adjust No. 5 guide laterally.

**[If there is space at No. 5 guide]**

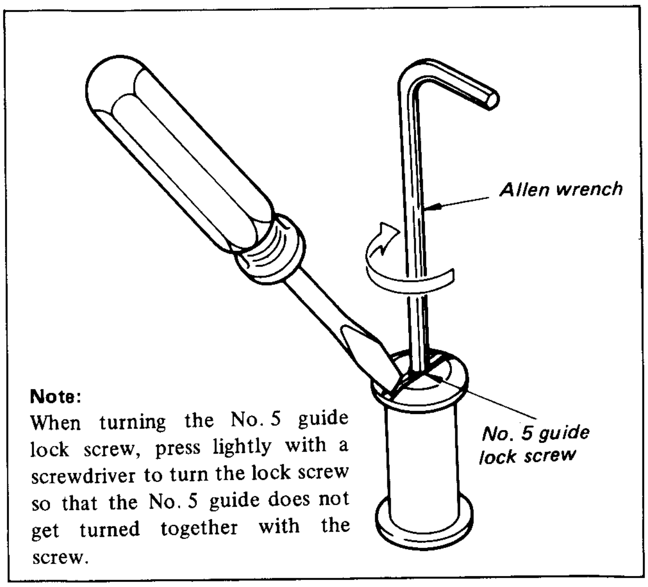
Turn No. 4 guide conterclockwise to raise the tape and remove the space at No. 5 guide.

**Note:**

Be careful not to create a large space at the bottom of No. 4 guide.

**[If there is curl]**

1) When there is a space at the bottom of No. 4 guide: Lean the adjust plate of No. 3 guide toward the outside until the point just before the lower tape tension loosens.
2) When there is curl but no space at the bottom of No. 4 guide:
   i) Confirm that No. 4 guide is not raised too high. Turn clockwise to lower if necessary.
   ii) If this does not slove the problem, tighten No. 5 guide lateral adjustment screw by turning clockwise until the curl disappears.



**Note:**
When turning the No. 5 guide lock screw, press lightly with a screwdriver to turn the lock screw so that the No. 5 guide does not get turned together with the screw.

*Fig. 4-5.*

### 4-1-3. Exit Side Adjustment

1) Turn the tracking control knob counterclockwise to lower the RF output waveform to about 60% of the maximum.
2) Raise No. 7, 8 guides to free the tape transportation, and check the waveform. (This waveform is called "exit free waveform".)

**Note:**
Be careful not to raise the guides too much. They should be raised about 0.3 mm, and also, the tape shoùld not touch the ACE head bottom flange. (Fig. 4-6)

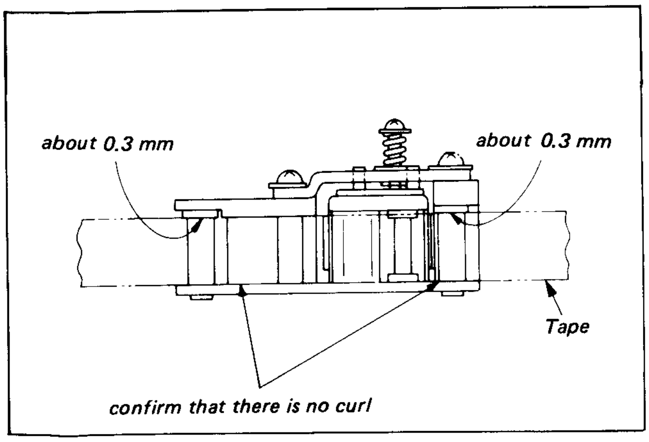


*Fig. 4-6.*

   i) If the exit free waveform is within the range illustrated in Fig. 4-7(a), (b), proceed with exit side adjustment.
   ii) If it is not within the specified range, follow the adjustment procedure in 4-3.

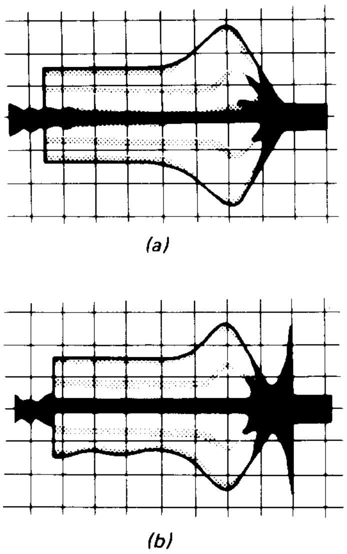


*Fig. 4-7.*

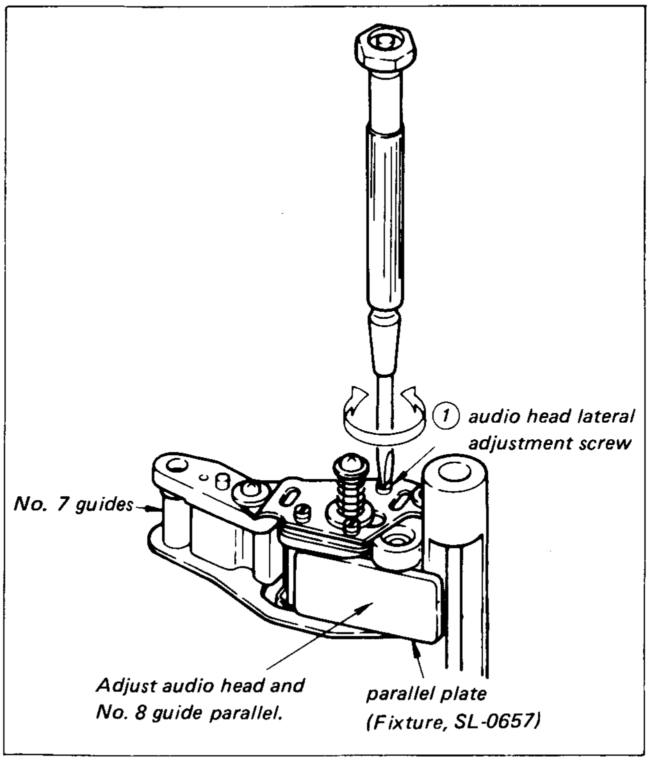
3) Flatten the waveform with No. 7 guide, and match No. 8 guide to the tape. (Lower the guide to the point just before the waveform changes, and where there is no curl.) At this time, the exit side waveform may rise slightly, so lower No. 7 guide again to flatten it, and match No. 8 guide to the tape.
4) Confirm that there is no curl at No. 7, 8 guides in forward mode.
5) Confrim that curl and space do not appear at No. 8 guide in reverse mode. If curl or space appears, adjust with No. 9 guide.

## 4-2. ADJUSTMENT AFTER REPLACEMENT OF THE ACE ASSEMBLY

Perform the following adjustments after removing or replacing the ACE assembly.

### 4-2-1. Tracking Adjustment

1) Position the parallel plate (Fixture, SL-0657) at shown in Fig. 4-8, and turn audio head lateral adjustment screw ① to adjust the audio head vertically.



① audio head lateral adjustment screw
No. 7 guides
Adjust audio head and No. 8 guide parallel.
parallel plate (Fixture, SL-0657)

*Fig. 4-8.*

2) Turn the tracking control knob counterclockwise to lower the RF output waveform to about 60% of the maximum.
3) Play back the tracking portion of the alignment tape KR5-2H(868-54), raise No. 7, 8 guides about 0.3 mm, and check the exit free waveform of the RF output waveform.

   **Note:**
   Be sure that the tape does not touch the bottom flange of the ACE assembly.

   i) If the waveform is within the range illustrated in Fig. 4-7(a), (b), proceed with the adjustment.
   ii) If the exit free waveform appears as shown in Fig. 4-10, turn the ACE lateral adjustment screw clockwise until the waveform is within the range illustrated in Fig. 4-7(a), (b).
   iii) If the exit free waveform appears as shown in Fig. 4-10, turn the ACE lateral adjustment screw counterclockwise to obtain the waveform shown in Fig. 4-9, then turn clockwise again until the waveform is within the range shown in Fig. 4-7.

4) Turn the No. 7 guide to flatten the waveform, and match the No. 8 guide to the tape. (Lower the guide until the point just before curl appears at No. 8 guide flange.)
5) If the RF output waveform is as shown in Fig. 4-9, where the exit side is not flat, lower No. 7, No. 8 guides again to flatten it.

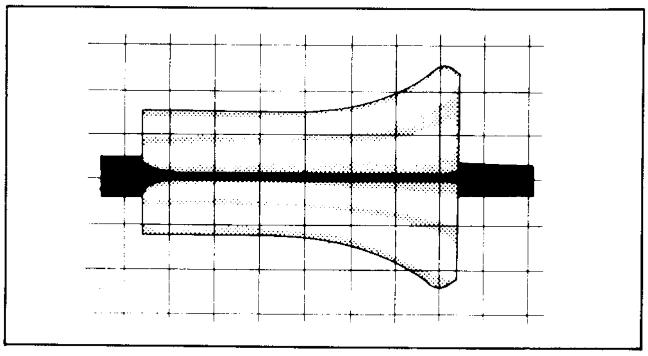


*Fig. 4-9.*

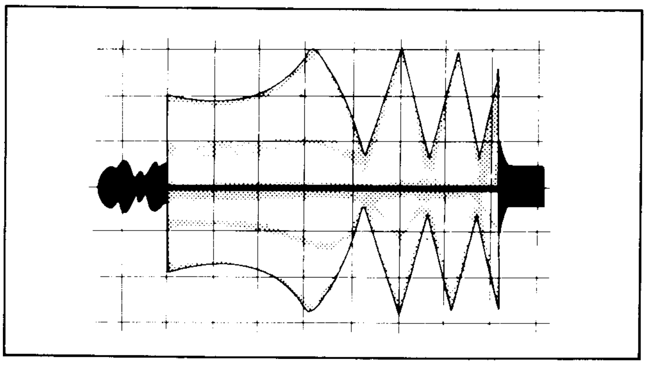


*Fig. 4-10.*

### 4-2-2. Audio Head (ACE Assembly) Azimuth Adjustment

1) Connect the oscilloscope as follows:
   CN501 ..... 1 pin (AM-3 board)
   Play back the 5 kHz portion of the alignment tape.
2) Turn the azimuth adjustment screw (Fig. 4-11) so that the amplitude of the 5 kHz waveform is maximum.

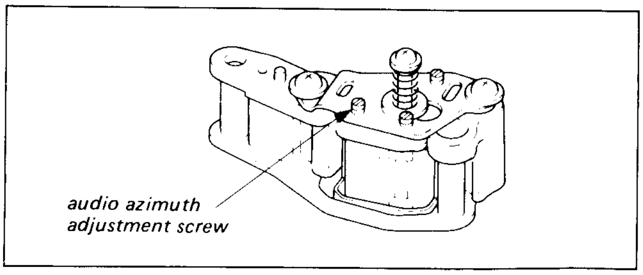


*Fig. 4-11.*

## 4-2-3. CTL Head (ACE Assembly) Position Adjustment

This adjustment is both mechanical and electric: mechanically, it is the adjustment of the CTL head position, and electrically, it is the tracking control center adjustment. The procedure involves performing the electrical adjustment first, then the head position adjustment.

1) Connect the oscilloscope as follows:
   1ch: CN2 . . . . . . 5 pin (RY-1 board)
   2ch: CN501 . . . . 1 pin (AM-3 board)
   External trigger: CN2 . . . . . . 3 pin (RY-1 board)
2) Play back the tracking portion of the alignment tape.
3) Turn the tracking control knob back and forth, and confirm that the output waveform level is maximum at the center click position, and that the 0 level of the audio signal is at the point where the RF output waveform Bch waveform appears, as shown in Fig. 4-12.
   If adjustment is necessary, proceed as follows.

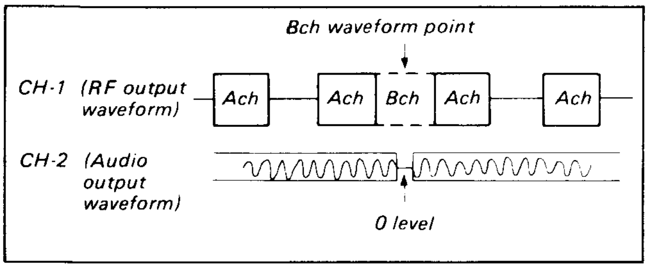


*Fig. 4-12.*

4) Tracking Control Center Adjustment
5) CTL Head Position Adjustment
   Set the tracking control knob at the center detent position and loosen the two ACE assembly position adjustment screws ①. As shown in Fig. 4-13 slide the ACE assembly with a screwdriver until it is in the position shown in Fig. 4-12 and the RF output waveform is maximum. Tighten the screws ① when this position is obtained.
6) Replay the color bars of the alignment tape and check the picture quality.

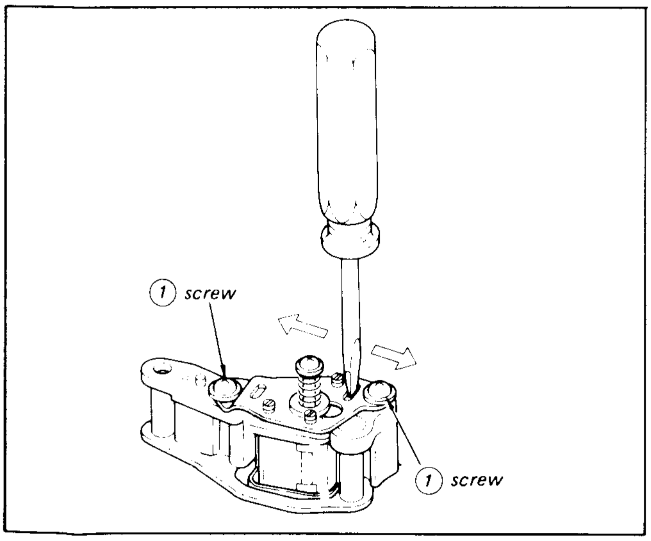


*Fig. 4-13.*

## 4-2-4. Audio Head (ACE Assembly) Height Adjustment

Perform this adjustment only after completing the exit side tracking adjustment.

1) Oscilloscope connection:
   1ch: CN501 . . . . 1 pin (AM-3 board)
   Replay the 5 kHz portion of the alignment tape.
2) Turn the audio head height adjustment screw ① and the lateral adjustment screw ② (Fig. 4-14) until the audio output waveform amplitude is maximum.

   **Note:**
   Both of these adjustment screws should be turned in the same direction at the same angle, less then 30°.

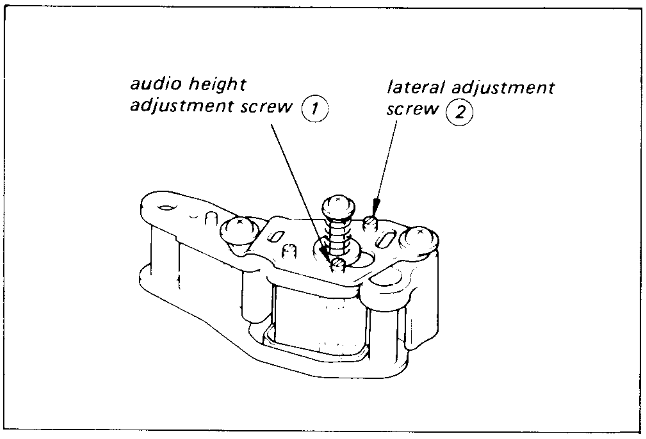
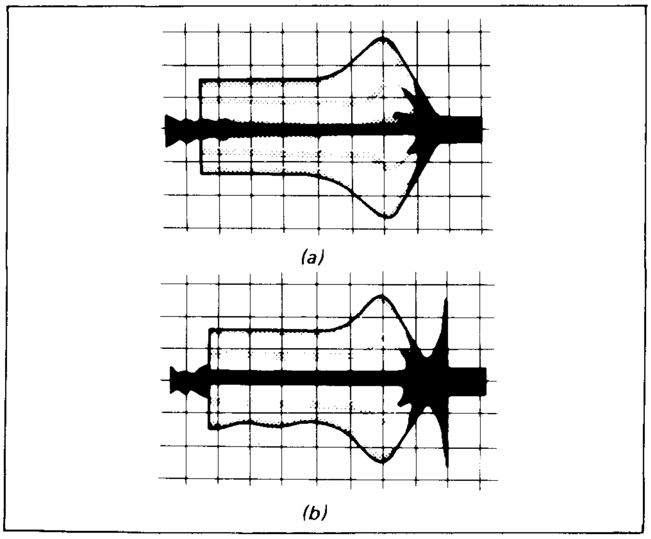


*Fig. 4-14.*

## 4-3. ADJUSTMENT AFTER REPLACEMENT OF THE CAPSTAN MOTOR

1) Perform the vertical adjustment of the capstan shaft according to 3-4. Replacement and Adjustment of Capstan Motor.
2) Play back the tracking portion of the alignment tape.
   Connect the oscilloscope as follows:
   1ch: CN2...... 5 pin (RY-1 board)
   2ch: CN2...... 3 pin (RY-1 board)
3) Turn the tracking control knob clockwise to lower the RF output waveform to about 60% of the maximum.
4) Raise No. 7, 8 guides a little, and check the exit free waveform.
   i) If the exit free waveform is within the range indicated in Fig. 4-15(a), (b), proceed from step 5).


(a)

(b)

Fig. 4-15

   ii) If the peak of the exit free waveform is smaller than that illustrated in Fig. 4-15(a) (e.g. Fig. 4-16), loosen the lock screw, then turn the capstan adjustment screw until the waveform is within the specified range.

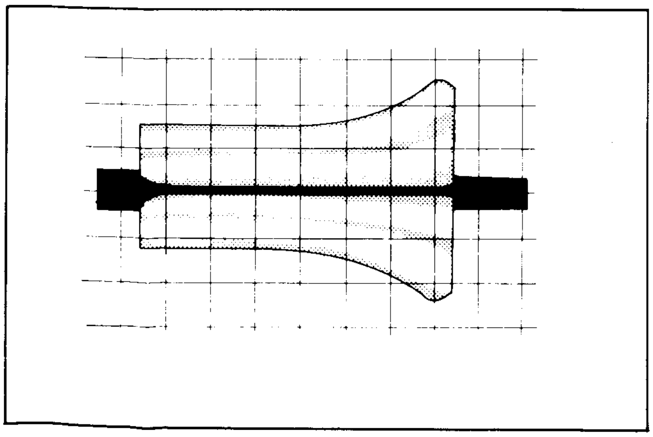


Fig. 4-16

   iii) If the peak shape of the exit free waveform differs from that shown in Fig. 4-15(b) (e.g. Fig. 4-17), loosen the lock screw, then turn the capstan adjustment screw clockwise until the waveform is within the specified range.

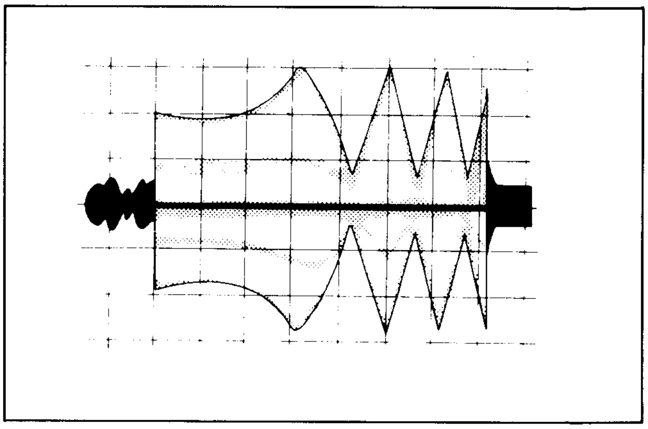


Fig. 4-17

**Note:**
After turning the capstan adjustment screw, wait until the waveform stabilizes (about 10 — 15 seconds) before continuing with the adjustment.

5) Lock the capstan lock screw. (Turn clockwise until is stops, then turn about 30° more. At this point, the exit free waveform will change slightly, and if it goes out of the range shown in Fig. 4-15(a), (b) return to step 4) and re-adjust.
6) Flatten the waveform with No. 7 guide, and match No. 8 guide to the tape. If the exit waveform rises, flatten it again with No. 7 guide and match No. 8 guide to the tape again.
7) Confirm and adjust according to 4-1-3, exit side adjustment procedure items 4), 5).

**Note:**
Check with L830 tape.

## 4-4. THIN TAPE MOVEMENT CHECK METHOD DURING TAPE PATH ADJUSTMENT

After confirming the tape path by using the procedures of section 4-1 through 4-3, check the thin tape movement by the procedure given below.

1) Prepare one reel of the commercial L-830. Remove the cassette lid with reference to Fig. 4-1.

2) Run L-830 prepared in the procedure 1 in the PLAY mode and check the following points;

   i) Entrance Side
   Check if the tape bends and is damaged on the No. 4 guide bottom flange, the No. 5 guide top flange and the No. 6 guide top flange. (The curl of the tape is allowed), but the bend of the tape is not allowed.) (Fig. 4-18)

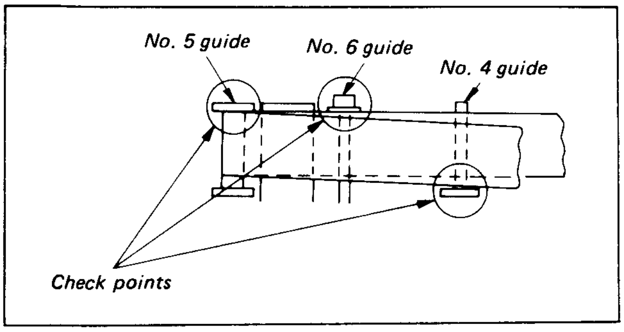


*Fig. 4-18.*

   ii) Exit side
   Check if the tape bends and is damaged on the No. 7 guide top flange, the No. 8 guide top flange and the No. 10 guide top and bottom flanges. (The curl of the tape is allowed, but the bend of the tape is not allowed.) (Fig. 4-19)

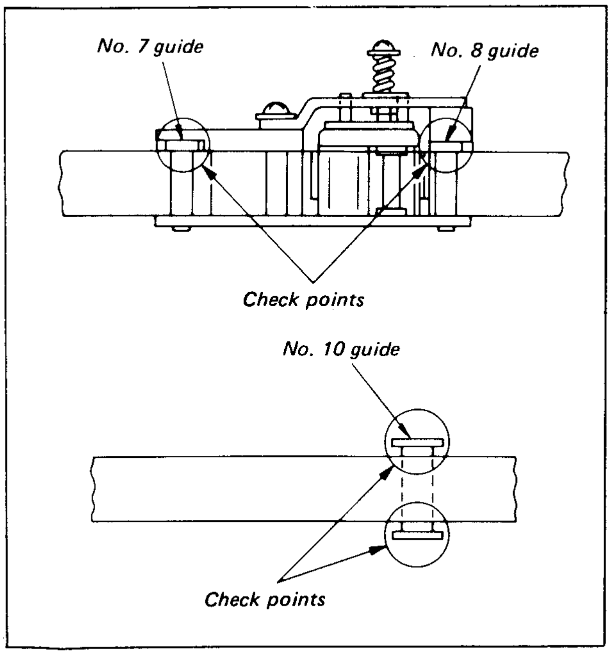


*Fig. 4-19.*

3) If the tape did not run normally in step 2, readjust the tape path by using KR5-2H.

   a) The tape did not run normally on the entrance side, refer to 4-1-2.

   b) The tape did not run normally on the exit side, refer to 4-1-3.

# SECTION 5
# ELECTRICAL ALIGNMENT

All the electrical alignment can be performed by using the equipment mentioned below, the alignment tape, and the PAL colour bar signal (100%).

**[Equipment Required]**

(1) PAL Colour Monitor TV
(2) Oscilloscope, Dual-trace, Bandwidth . . . more than 10 MHz with delay mode
(3) Frequency Counter
(4) PAL Colour-Bar Generator
(5) Digital voltmeter
(6) VOM (20 kΩ/V)
(7) Audio Signal Generator
(8) Audio level meter (VTVM)
(9) Attenuator
(10) Alignment Tape, type: KR5-2H, Code No. 8-969-995-52
(11) Alignment Tool (Adjusting screwdriver for semi-fixed resistors and coils)
Jig No. SL-0001, Code No. J-6080-001-A

**[Setup for Alignment]**

The antenna should be connected correctly to the antenna input terminal of the videocassette recorder.

It is important that the video output signal satisfies the specification because the telecast signal received by the incorporated tuner of the videocassette recorder is utilized as the adjustment signal of the machine. The incorporated tuner should be set to the channel with the best reception. The video signal should be checked with an oscilloscope connected to VIDEO OUT (BNC connector). Verify that the sync signal amplitude is approx. 0.3 Vp-p and the video signal amplitude is approx. 0.7 Vp-p at peak. Adjust the fine tuning while observing the signal and the TV screen so that the burst signal amplitude becomes approx. 0.3V ± 0.1 Vp-p. Also confirm that there is not spikes observed at the sync signal portion. (See Fig. 5-1.)

The video (colour bar) signal for the alignment is shown in Fig. 5-1.

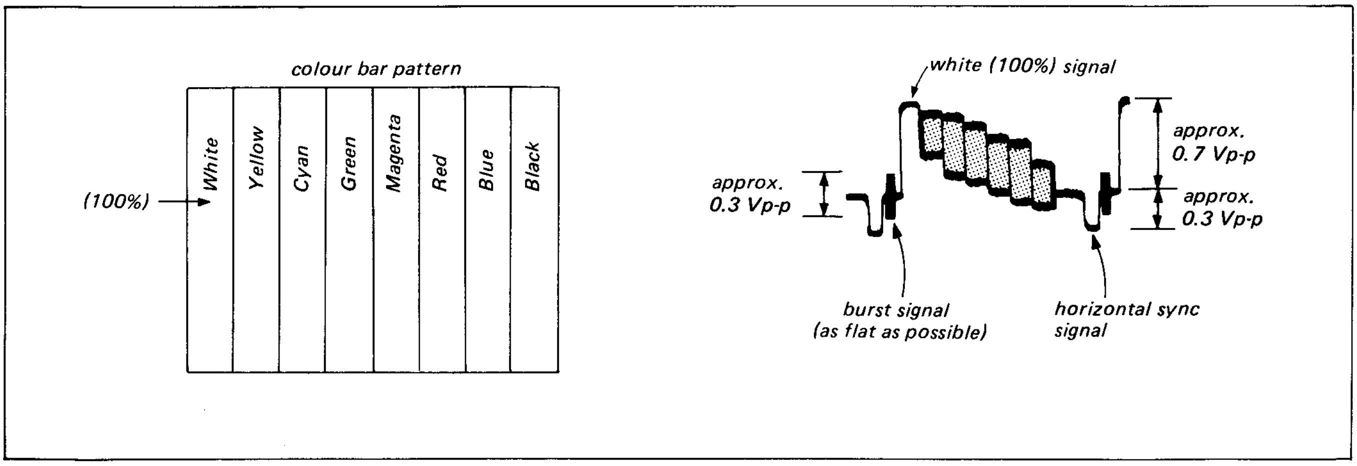


*Fig. 5-1. Video (colour-bar) signal*

**[Alignment Tape]**

**KR5-2H**

| | Video signal | Audio signal | Playing time | Use for |
|---|---|---|---|---|
| 1. | Colour bars | 3 kHz – 5 dB | 5 min | General performance, tape speed checks, switching position adjustment. |
| 2. | Monoscope | 333 Hz – 25 dB | 5 min | Video head dihedral, audio level adjustment. |
| 3. | RF sweep | 5 kHz – 25 dB | 5 min | Video, audio frequency characteristics, audio azimuth adjustment<br>marker: 1, 2, 3.58, 4.5, 5.2 MHz |
| 4. | Tracking<br>1 MHz (CH-B)<br>*1 (Channel B is inserted in every 3 frames.) | 1 kHz – 5 dB<br>*2 (Signal is dropped out in the positions where channel B is inserted.) | 5 min | Tracking, Audio height adjustments CTL Position check<br>(Check if *1 and *2 are the same position.) |

**[Alignment Tool for Semi-fixed Variable Resistors and Coils]**
Semi-fixed variable resistors and inductances should be adjusted with the alignment tool exclusively prepared for the adjustment of the components. A common screwdriver is too large for adjusting the components from the conductor side of a printed circuit board.

The metal blade of the alignment tool is used for variable resistors and trimmer capacitors and the plastic tip is used for variable inductances.

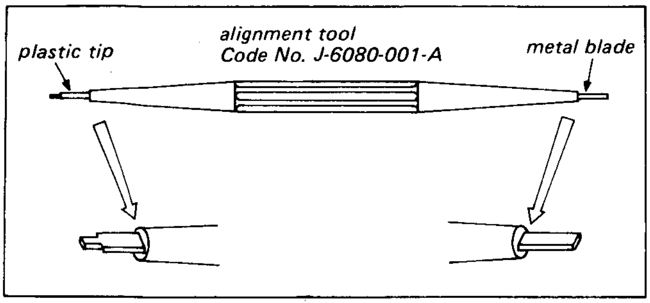

plastic tip
alignment tool
Code No. J-6080-001-A
metal blade

*Fig. 5-2. Alignment tool*

**[Required levels and Impedances of Input and Output]**

**Video**

Input VIDEO IN: BNC connector
1 Vp-p $^{+1.0}_{-0.5}$ Vp-p
75Ω unbalanced, sync negative
VIDEO OUT: BNC connector
1 Vp-p ± 0.1 Vp-p
75Ω unbalanced, sync negative

**Audio**

Input AUDIO IN: phono jack
47 kΩ, −10 dBs
(0 dBs = 0.775V rms)
Output AUDIO OUT: phono jack
Load impedance less than 10 kΩ
−10 dBs with 47 kΩ load unbalanced

**[Colour Bar Signal]**
The 100% colour bar signal recorded on the Alignment tape is shown in Fig. 5-3.

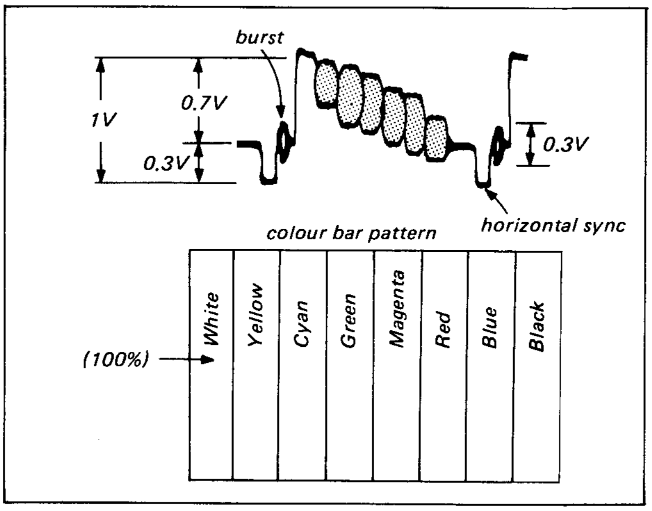
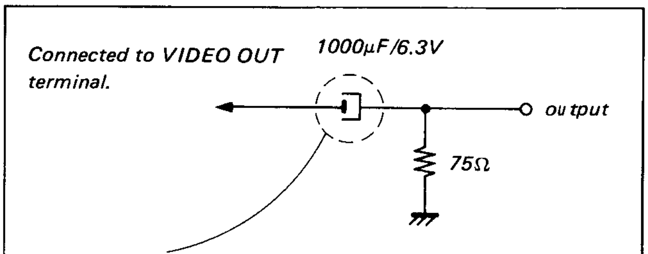

burst
1V
0.7V
0.3V
0.3V
colour bar pattern
horizontal sync
(100%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Black

*Fig. 5-3. Colour bar signal recorded on the alignment tape*

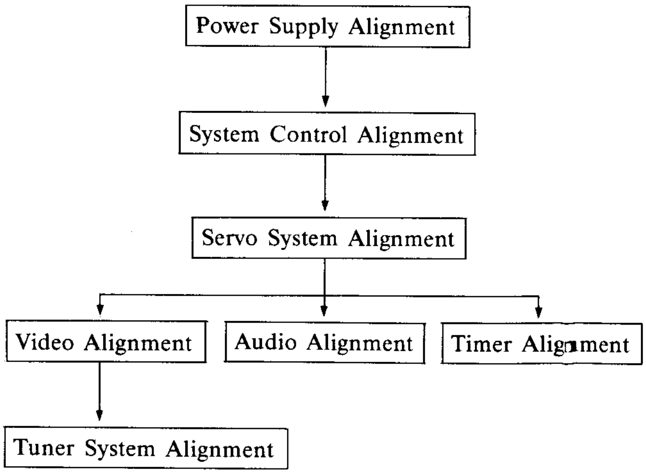
**[75Ω Terminating Method]**
To terminate the video output terminal follow the steps shown in Fig. 5-4.


Connected to VIDEO OUT terminal.
1000μF/6.3V
output
75Ω

**Note:** *The machine may be damaged if it is terminated in 75Ω before cutting the DC component.*

*Fig. 5-4. 75Ω terminating circuit*

**[Adjustment procedure]**
Adjust in the order given below.


Power Supply Alignment
System Control Alignment
Servo System Alignment
Video Alignment
Audio Alignment
Timer Alignment
Tuner System Alignment

## 5-1. POWER SUPPLY CHECK (PS-22 Board)

Measure an E-E mode (power supply switch ON).

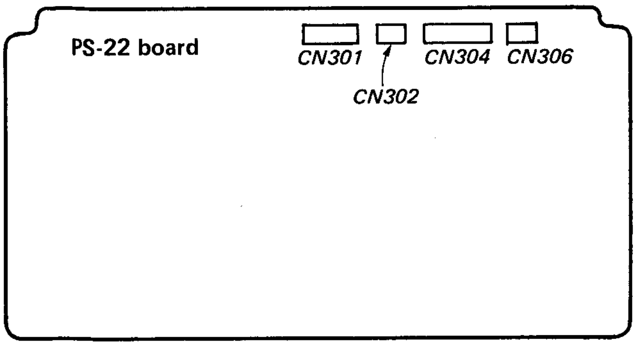


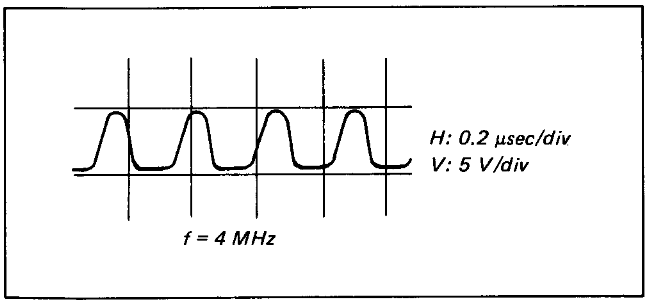
*Fig. 5-5. Component layout*

1. Unswitched 12V Check
   Pin ⑦ of CN304 shall be 12 ± 0.5V.
2. Switched 12V Check
   Pin ③ of CN301 shall be 12.2 ± 0.2V
3. Switched 9V Check
   Pin ① of CN306 shall be 9.0 ± 0.2V
4. Switched 5V Check
   Pin ① of CN301 shall be 5.2 ± 0.5V

## 5-2. SYSTEM CONTROL CHECK (SS-16 Board)

### 1. Clock Frequency Check

Mode: E-E
Signal: None
Frequency counter: Pin ㉖ of IC601 (TP601)
Check: f: 4 MHz



## 5-3. SERVO SYSTEM ALIGNMENT

Alignment Sequence
1. Drum servo system alignment
2. Capstan servo system alignment

### 5-3-1. Drum Servo System Alignment

1) Drum Free Speed Adjustment (SS-16 Board)
Mode: Playback
Signal: Alignment tape colour bar, or monoscope
Oscilloscope: CH-1 TP405 (Pin ⑬ of IC301)
CH-2 TP402 (Pin ㊴ of IC301)

**[Alignment method]**
Adjust to 553 µsec ± 10 µsec with RV303. (See Fig. 5-7.)

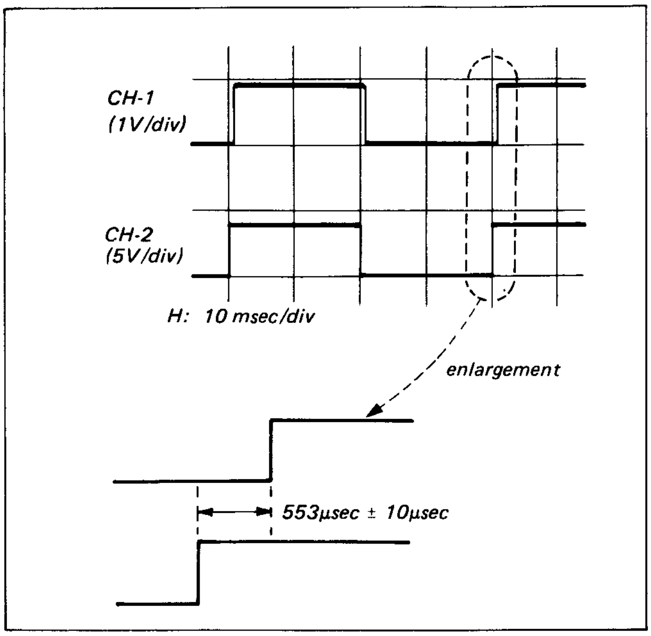


*Fig. 5-7. Drum free speed adjustment*

2) RF Switching Position Adjustment (SS-16 Board)
Mode: Playback
Signal: Alignment tape colour bar or monoscope
Oscilloscope: CH-1 TP402 (Pin ㊴ of IC301)
CH-2 Pin ㊵ of IC301

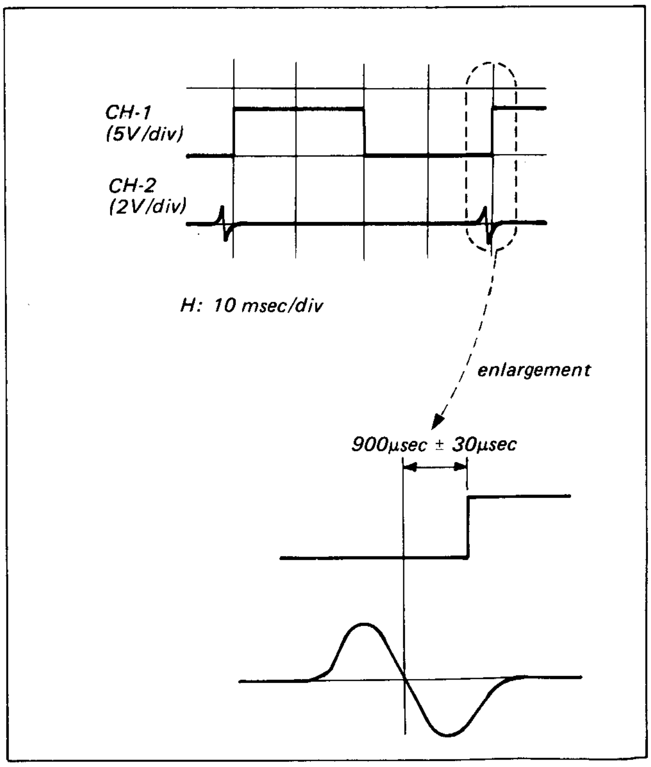


*Fig. 5-8. RF switching position adjustment (1)*

**[Adjustment method]**

i) Adjust to 900 μsec ± 30 μsec with RV302. (See Fig. 5-8.)
ii) Change connection of CH-2 only to Pin ㉜ of IC301.
iii) Adjust to 900 μsec ± 30 μsec with RV301. (See Fig. 5-9.)

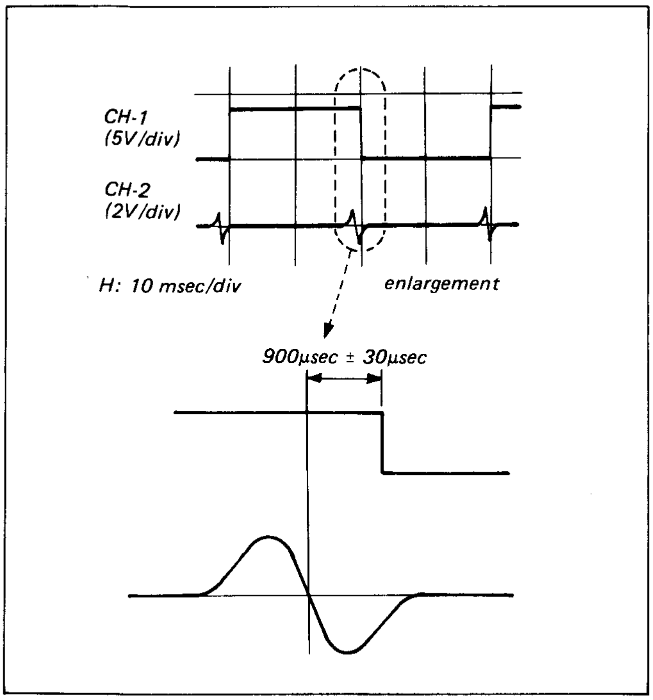

CH-1
(5V/div)
CH-2
(2V/div)
H: 10 msec/div
enlargement
900μsec ± 30μsec

*Fig. 5-9. RF switching position adjustment (2)*

3) PICTURE SEARCH, Drum Free Speed Adjustment (SS-16 Board)
Mode: PICTURE SEARCH (FWD)
Signal: Alignment tape colour bar or monoscope
Frequency counter: Pin ④ of CN312 (TP404)

**[Adjustment method]**

Adjust to 64 μsec ± 0.3 μsec with RV310. (See Fig. 5-10.)

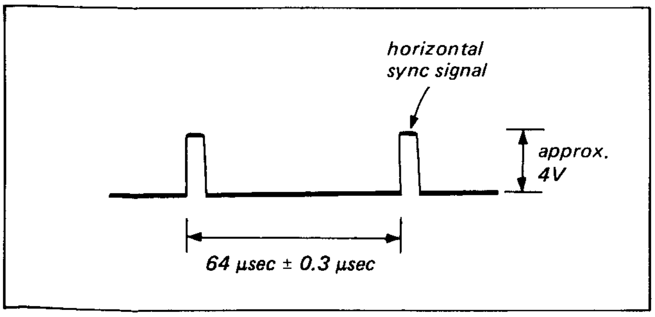

horizontal
sync signal
approx.
4V
64 μsec ± 0.3 μsec

*Fig. 5-10. PICTURE SEARCH, drum free speed adjustment*

### 5-3-2. Capstan Servo System Alignment

1) Capstan DC Bias Adjustment (SS-16 Board)
Mode: playback
Signal: Alignment tape colour bar or monoscope
Oscilloscope: TP407 (Pin ⑳ of IC301)

**[Adjustment method]**

Adjust the duty (ratio for A and B) to 50% ± 5% with the RV307.

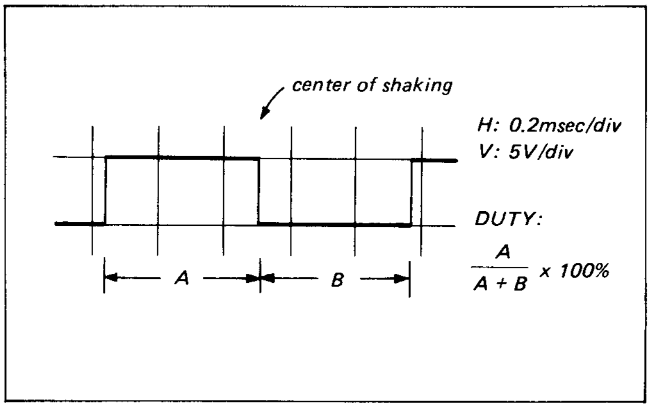

center of shaking
H: 0.2msec/div
V: 5V/div
DUTY:
A / A + B x 100%
A
B

*Fig. 5-9. Capstan DC bias adjustment*

2) PICTURE SEARCH, Capstan DC Bias Adjustment (SS-16 Board)
Mode: PICTURE SEARCH (FWD)
Signal: Alignment tape colour bar or monoscope

**[Adjustment method]**

i) Set up the picture search (forward) mode and adjust with RV308 so that the progression of noise bars becomes as slow as possible. (See Fig. 5-10.)
ii) Set up the picture search (reverse) mode and check that noise bars do not progress very quickly.

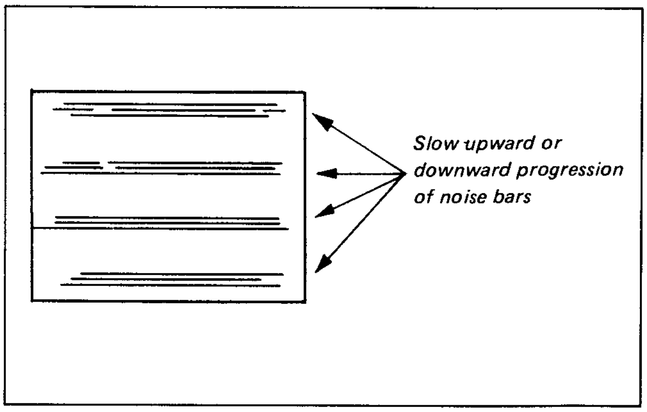

Slow upward or
downward progression
of noise bars

*Fig. 5-10. PICTURE SEARCH, capstan DC bias adjustment*

3) Tracking Center Adjustment (SS-16 Board)

| | |
|---|---|
| Mode: | Playback |
| Signal: | Alignment tape colour bar, or monoscope |
| Oscilloscope: | CH-1 TP405 (Pin ⑬ of IC301) |
| | CH-2 TP406 (Pin ⑮ of IC301) |

**[Adjustment method]**

i) Set the TRACKING knob to the center click position.

ii) Adjust to 7.05 msec ± 0.05 msec with RV304. (See Fig. 5-11.)

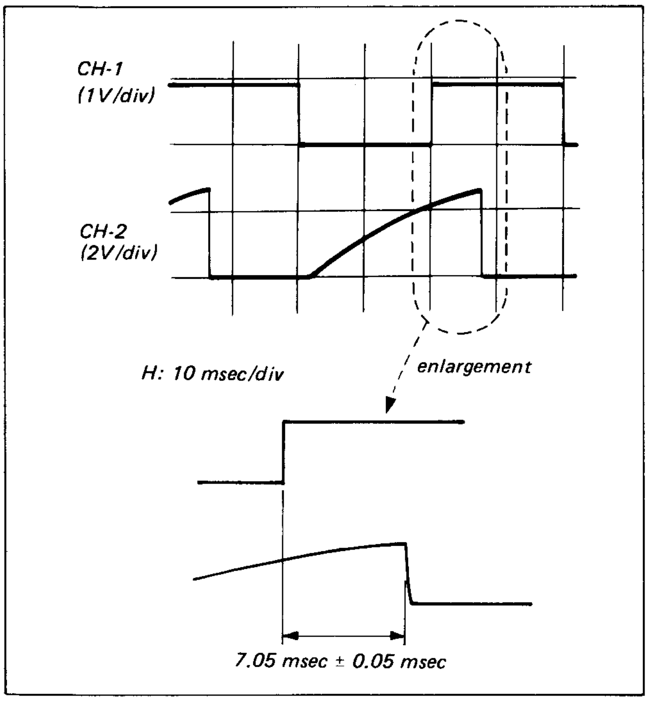


*Fig. 5-11. Tracking center adjustment*

## 5-4. PAL VIDEO SYSTEM ALIGNMENT

As a rule, first the playback system is aligned with an alignment tape to check that it operates normally, then the recording system is aligned.
The alignment sequence is shown below. The Y signal and chroma signal systems are aligned for both playback and recording systems.
Colour video signal supplied by the PAL colour bar generator is used as video input signal for video system alignment in the record mode. Check that the sync and colour burst signals conform to the specifications designated in "Set-up for Alignment" in Fig. 5-1.

**[Playback System Alignment]**

1. Playback frequency characteristic adjustment
2. Expand adjustment
3. Y-comb adjustment
4. Dropout compensator adjustment
5. Playback video level adjustment
6. Carrier balance adjustment
7. Chroma comb filter adjustment
8. Jog exchange chroma level adjustment
9. Shift adjustment

**[Record System Alignment]**

1. Sync and peak AGC adjustment
2. Carrier set adjustment
3. Deviation adjustment
4. Compress adjustment
5. 1/2 $f_H$ shift adjustment
6. Dark clip and white clip adjustment
7. Y record current adjustment
8. 4.43 MHz REF adjustment
9. Pilot burst flag adjustment
10. ACC adjustment
11. AFC adjustment
12. AFC offset adjustment
13. Pilot burst signal level adjustment
14. Cleaning flag adjustment
15. Chroma record current adjustment

### 5-4-1. Playback System Alignment

1) Playback Frequency Characteristic Adjustment (RY-1 Board)
   - Adjust both the A and B channels.
   - The B channel indicated by (  ).

   Mode: Playback
   Signal: Alignment tape RF sweep
   Oscilloscope: TP1 (Pin ⑤ of CN2)
   External trigger: TP2 (Pin ④ of CN2)

**[Adjustment method]**

i) Turn tracking knob to maximum output.
ii) Adjust RV2 to make the 2 MHz amplitude of A and B channels equal. (See Fig. 5-12)
iii) Set the trigger slope to −(+).
iv) Adjust the 5.2 MHz amplitude to 55 — 75% of the 2 MHz amplitude with RV3 (RV4).

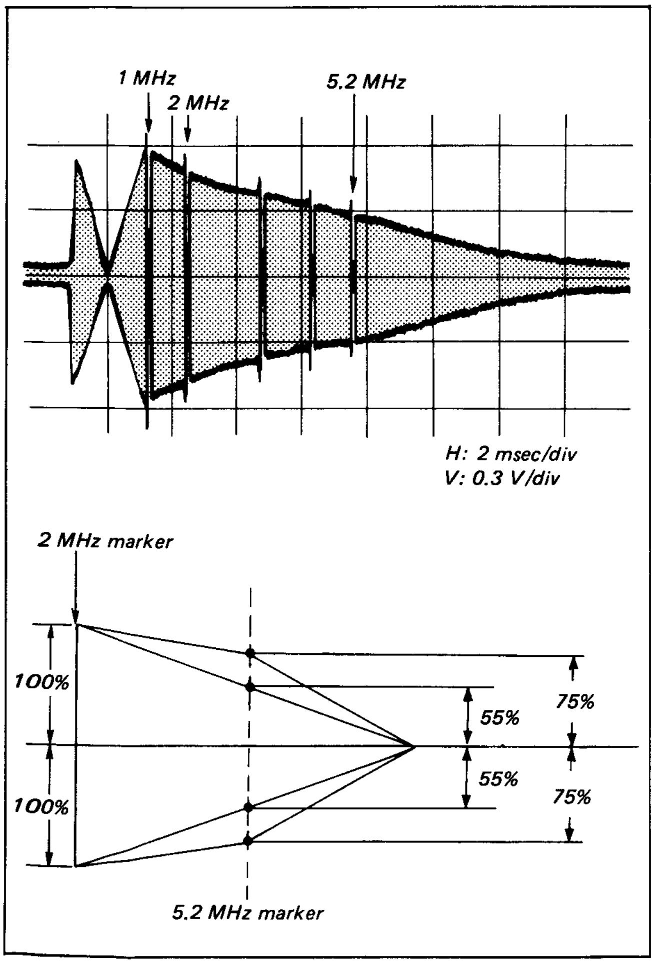


*Fig. 5-12. Playback amplifier frequency characteristic adjustment*

2) Expand Adjustment (RY-1 Board)
   Mode: Playback
   Signal: Colour bar
   Digital voltmeter: See Fig. 5-13.

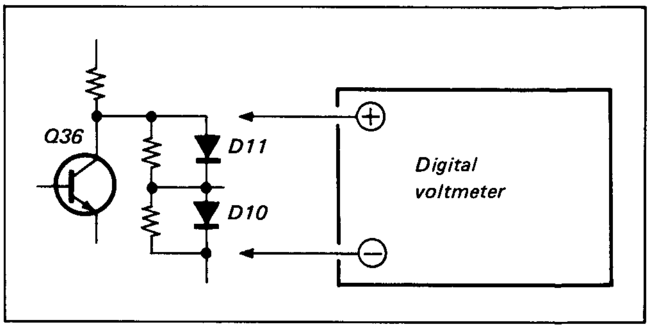


*Fig. 5-13.*

**[Adjustment method]**

i) Adjust to 0.43 ± 0.01 Vdc with RV13.

3) Y-Comb Adjustment (RY-1 Board)
   Mode: Playback
   Signal: Colour bar
   Oscilloscope: Pin ⑮ of IC4

**[Adjustment method]**

i) Adjust RV12 for minimum output. (See Fig. 5-14.)

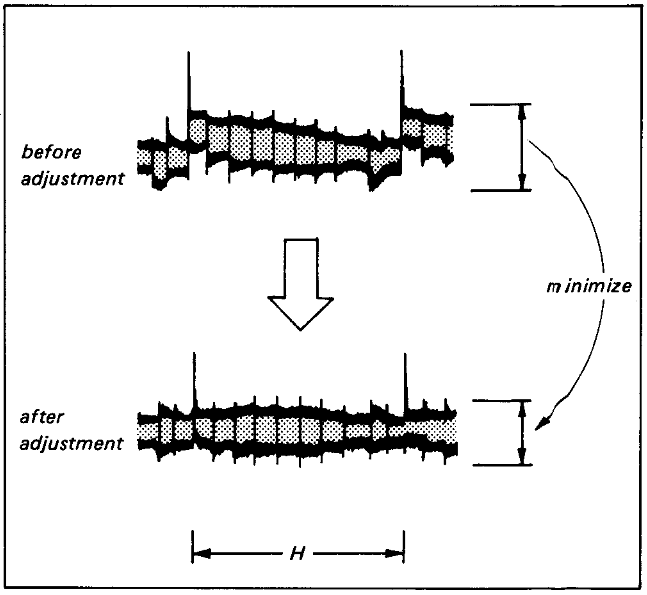


*Fig. 5-14. Y-comb adjustment*

4) Dropout Compensator Threshold Adjustment (RY-1 Board)
   Mode: Playback
   Signal: A recorded tape with dropouts

**[Adjustment method]**

i) Turn RV11 fully clockwise (↻) as seen from the pattern side. In this state, dropouts appear on the monitor screen.
ii) Slowly turn RV11 counterclockwise (↺) and set to make the dropouts disappear.
iii) Rewind the tape and verify that the dropouts described in (i) above have disappeared.

5) Playback Video Level Adjustment (RY-1 Board, YC-25 Board)

| | |
|---|---|
| Mode: | Playback |
| Signal: | Alignment tape colour bar |
| Oscilloscope: | VIDEO OUT (75Ω terminated) on YC-25 Board |

**[Adjusment method]**

i) Adjust to 1.0V ± 0.05 Vp-p with RV14 on RY-1 Board.

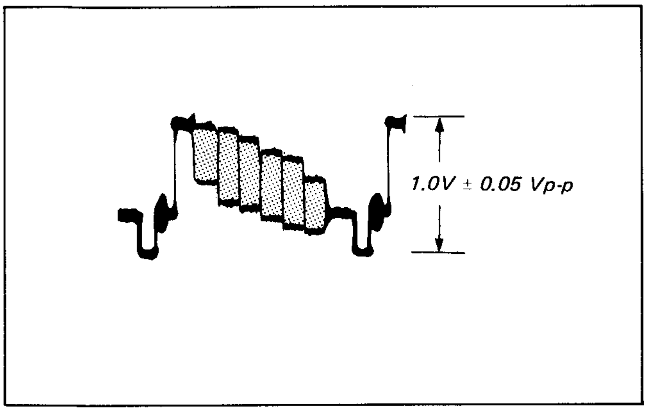


*Fig. 5-15. Playback video level adjustment*

6) Carrier Balance Adjustment (YC-25 Board)

| | |
|---|---|
| Mode: | Playback |
| Signal: | Alignment tape colour bar |

Adjust while observing the monitor TV screen.

**[Adjustment method]**

i) Minimize beats with RV004.

7) Chroma Comb Filter Adjustment (YC-25 Board)

| | |
|---|---|
| Mode: | Playback |
| Signal: | Alignment tape colour bar |

Adjust while observing the monitor TV screen.

**[Adjustment method]**

i) Minimize beats with RV003 and LV002.

8) JOG Exchange Chroma level Adjustment (YC-25 Board)

| | |
|---|---|
| Mode: | PB • PAUSE (STILL) |
| Signal: | colour bar |
| Oscilloscope: | Pin ⑧ of IC009 |

**[Adjustment method]**

i) Adjust RV013 so that the fluctuation of level is minimum. (See Fig. 5-16.)

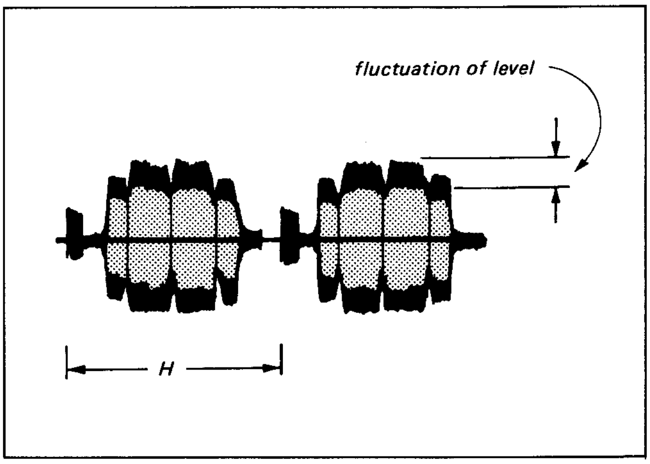


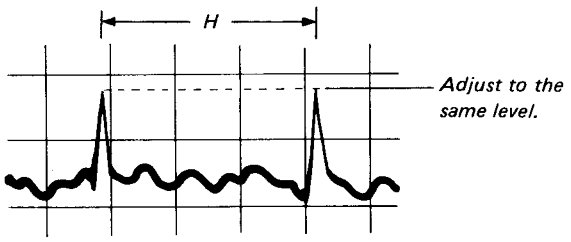
*Fig. 5-16. JOG EXCH. C. level adjustment*

9) Shift Adjustment (YC-25 Board)

| | |
|---|---|
| Mode: | Playback |
| Signal: | Alignment tape colour bar |
| Oscilloscope: | Base of Q034 |

**[Adjustment method]**

i) Align the signal level (per 1H) with RV008.



**Note:** *Signal sometimes appears on the lower side depending on the trigger condition.*

*Fig. 5-17. Shift adjustment*

### 5-4-2. Record System Alignment

1) Sync and Peak AGC Adjustment (YC-25 Board)
Mode: E-E
Oscilloscope: VIDEO OUT (75Ω terminated)
Signal: B/W

**[Adjustment method]**

i) Turn RV10 fully counterclockwise (↺) as seen from the pattern side. (Peak AGC off)
ii) Adjust to 1 Vp-p with RV11.
iii) Turn RV10 clockwise (↻) and set it so that the output level just starts to lower.

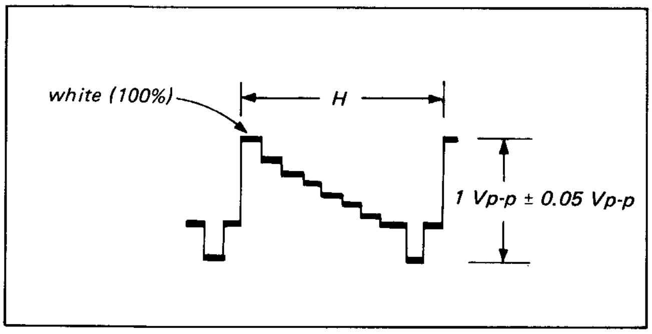


*Fig. 5-18. Sync and peak AGC adjustment*

2) Carrier Set Adjustment (RY-1 Board)
Mode: E-E
Signal: None
Frequency counter: Pin ④ of IC3

**[Adjustment method]**

1) Adjust to 3.8 MHz ± 0.04 MHz with RV8.

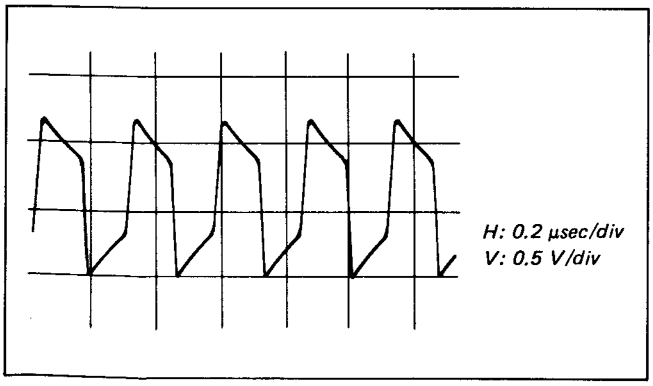


*Fig. 5-19. Carrier set adjustment*

3) Deviation Adjustment (YC-25 Board)

- The playback system adjustment and the carrier set adjustment in Paragraph 2) above must be completed before making this adjustment.

Mode: Self-recording and playback
Signal: Colour bar
Oscilloscope: Pin ④ of CN001, VIDEO OUT (75Ω terminated)

**[Adjustment method]**

i) Supply the colour bar signal and set up E-E mode.
ii) Connect the oscilloscope to Pin ④ of CN001.
iii) Adjust the Y signal level to 1 Vp-p with RV012.
iv) Set up RECORD mode.
v) Playback the recorded section of the tape.
vi) Connect the oscilloscope to VIDEO OUT.
vii) Check that the video signal level is 1.0 Vp-p ± 0.05 Vp-p, if the level is outside of this range, repeat Steps iv) through vi) above adjusting with RV012 until the standard value is obtained.

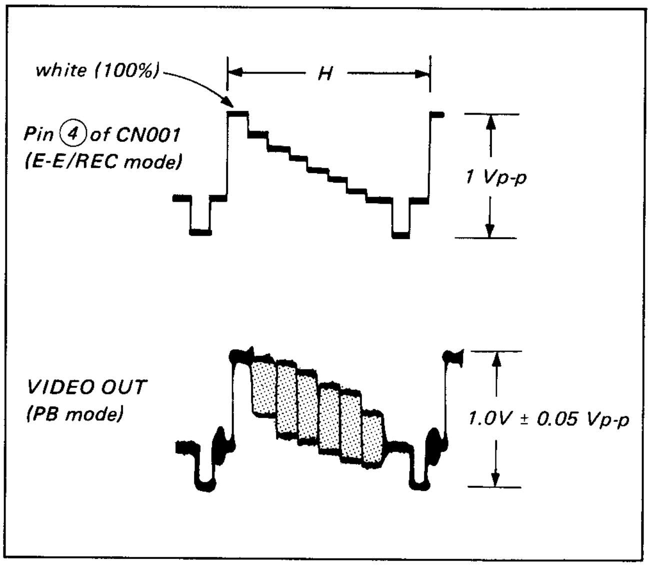


*Fig. 5-20. Deviation adjustment*

4) Compress Adjustment (RY-1 Board)
Mode: E-E
Signal: None
Digital voltmeter: See Fig. 5-21.

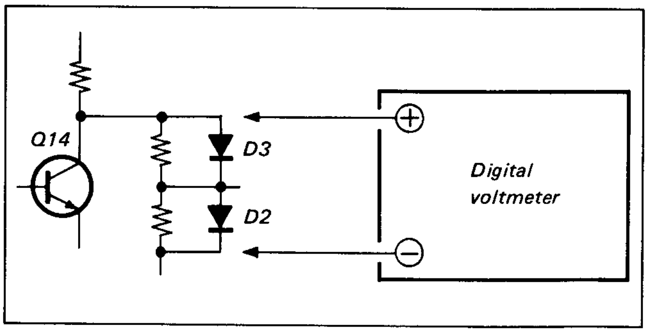


*Fig. 5-21.*

**[Adjustment method]**

i) Adjust to 0.3V ± 0.01 Vdc with RV7.

5) 1/2 $f_H$ Shift Adjustment (RY-1 Board)
Mode: Record
Signal: None
Spectrum analyzer: Pin ④ of IC3

**[Adjustment method]**

i) Adjust RV6 so that the fluctuation of frequency is 7.8 kHz ± 1.5 kHz.

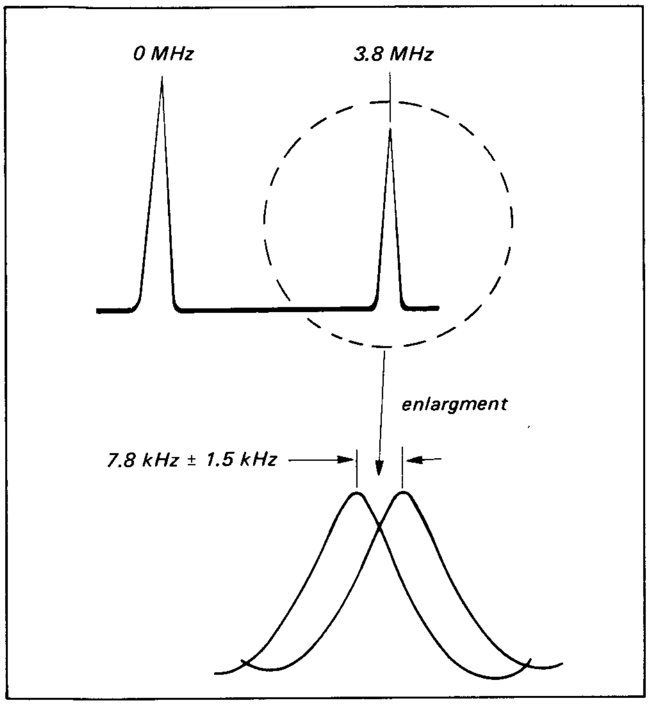

0 MHz
3.8 MHz
enlargment
7.8 kHz ± 1.5 kHz

*Fig. 5-22. 1/2 $f_H$ shift adjustment*

6) Dark Clip and White Clip adjustment (RY-1 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: Emitter of Q17

**[Adjustment method]**

i) Adjust RV10 so that the signal tip (dark peak) is 70% ± 10%. (See Fig. 5-23.)
ii) Adjust RV9 so that the signal tip (white peak) is 220% ± 10%.

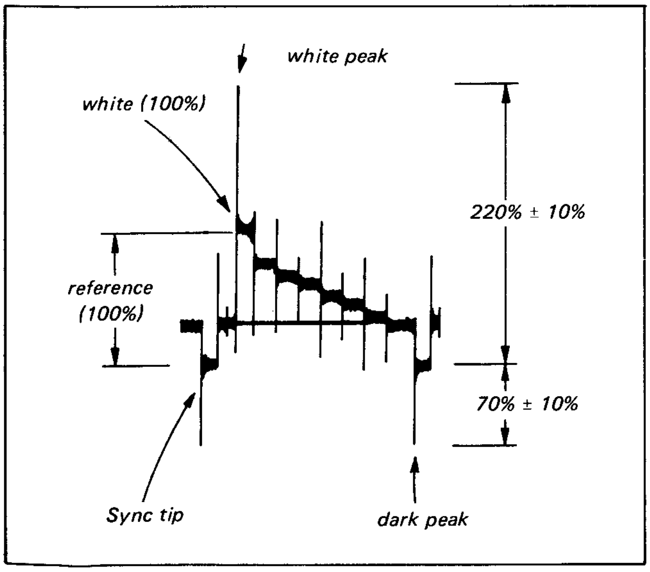

white peak
white (100%)
220% ± 10%
reference (100%)
70% ± 10%
Sync tip
dark peak

*Fig. 5-23. Dark clip and white clip adjustment*

7) Y Record Current Adjustment (RY-1 Board)
Mode: Record
Signal: None
Oscilloscope: Pin ② of CN3 (TP4)

**[Adjustment method]**

i) Adjust to 380 mV ± 10 mVp-p with RV1. (See Fig. 5-24)

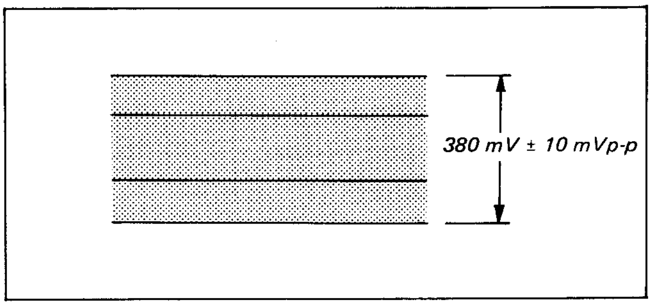

380 mV ± 10 mVp-p

*Fig. 5-24. Y record current adjustment*

8) 4.43 MHz REF. adjustment (YC-25 Board)
Mode: E-E
Signal: Colour bar
Frequency counter: Pin ⑦ of CN008

**[Adjustment method]**

i) Adjust to 4.433619 MHz ± 5 Hz with CV001.

9) Pilot Burst Flag Adjustment (YC-25 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ⑩ of IC12

**[Adjustment method]**

i) Adjust to 2.2 μsec ± 0.1 μsec with RV009. (See Fig. 5-25.)

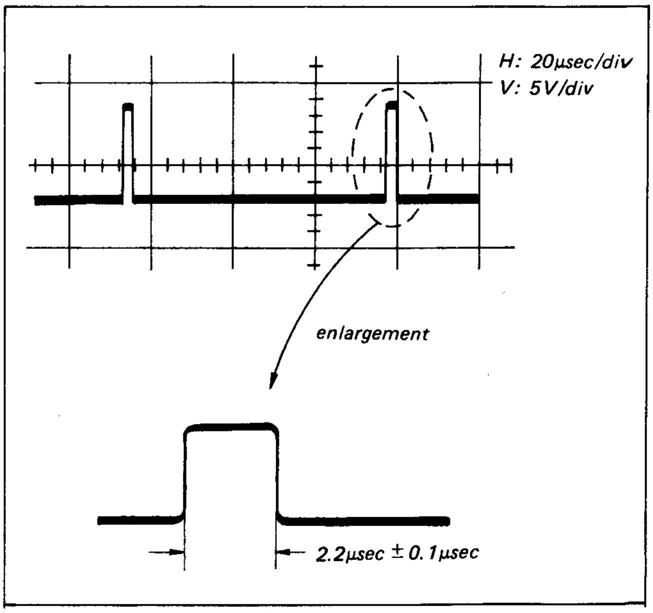

H: 20μsec/div
V: 5V/div
enlargement
2.2μsec ± 0.1μsec

*Fig. 5-25. Pilot burst flag adjustment*

10) ACC Adjustment (YC-25 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ㉔ of IC001

**[Adjustment method]**

i) Adjust to 0.68V ± 0.05 Vp-p with RV001.(See Fig. 5-26.)

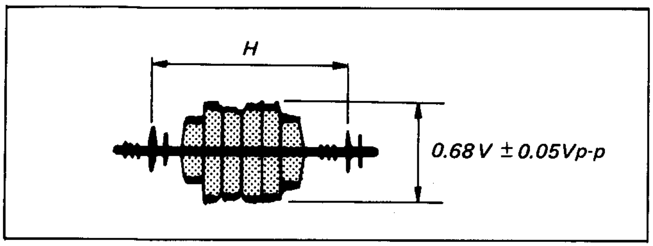

H
0.68 V ± 0.05Vp-p

*Fig. 5-26. ACC adjustment*

11) AFC Adjustment (YC-25 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ⑯ of IC003

**[Adjustment method]**

i) Adjut to 1.7 Vdc ± 0.1 Vdc with RV006. (See Fig. 5-27.)

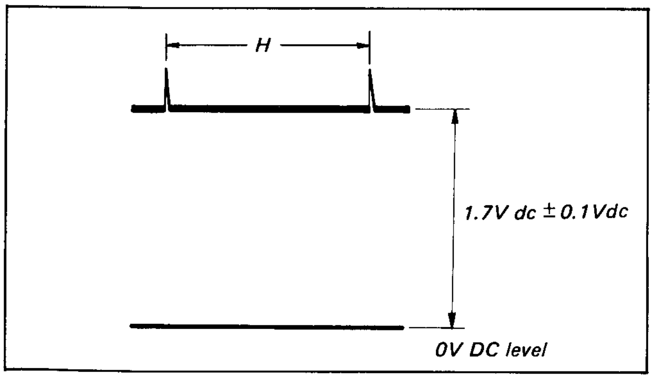

H
1.7V dc ± 0.1Vdc
0V DC level

*Fig. 5-27. AFC adjustment*

12) AFC Offset Adjustment (YC-25 Board)
Mode: Record
Signal: Colour bar
Oscilloscope: Pin ⑯ of IC003

**[Adjustment method]**

i) Adjust RV005 so that the fluctuation of DC level is minimum. (See Fig. 5-28.)

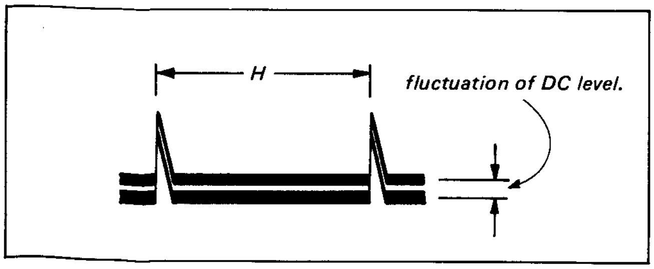

H
fluctuation of DC level.

*Fig. 5-28. AFC offest adjustment*

13) Pilot Burst Signal Level Adjustment (YC-25 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ⑧ of IC002

**[Adjustment method]**

i) Align the pilot burst signal with the chroma signal level using RV002.

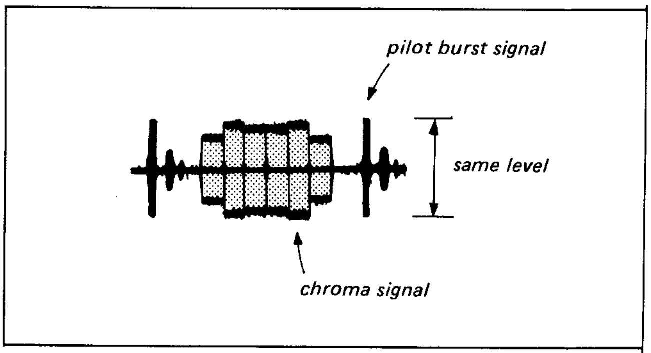

pilot burst signal
same level
chroma signal

*Fig. 5-29. Pilot burst signal level adjustment*

14) Cleaning Flag Adjustment (YC-25 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: CH1 Pin ⑥ of IC12
CH2 Pin ⑨ of IC12

**[Adjustment method]**

i) Adjust to 1.0 µsec ± 0.1 µsec with RV006. (See Fig. 5-30.)

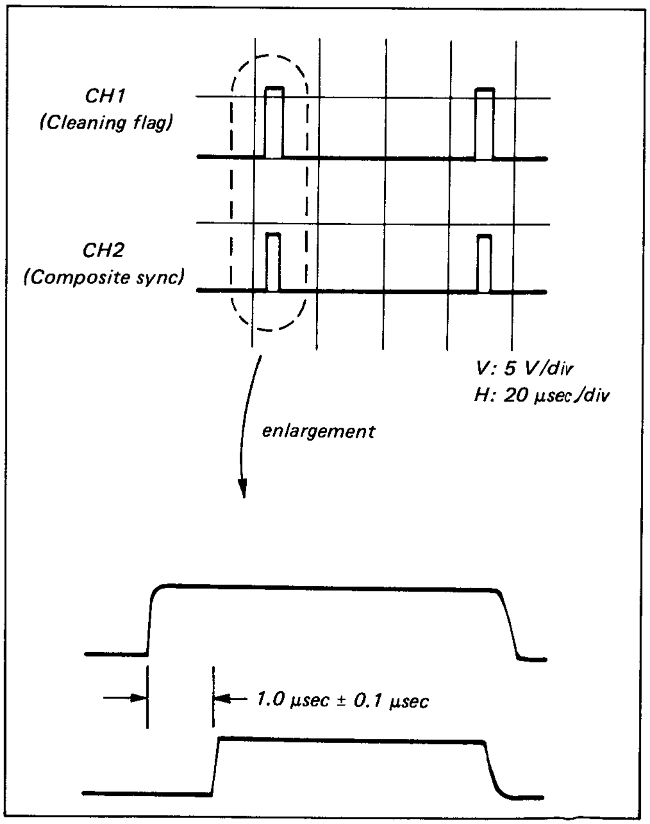

CH1
(Cleaning flag)
CH2
(Composite sync)
V: 5 V/div
H: 20 µsec/div
enlargement
1.0 µsec ± 0.1 µsec

*Fig. 5-30. Cleaning flag adjustment*

15) Chroma Record Current Adjustment (RY-1 Board)
Mode: Record
Signal: Colour bar
Oscilloscope: Pin ③ of CN3 (TP5)

**[Adjustment method]**

i) Adjust to 250 mV ± 10 mVp-p with RV5. (See Fig. 5-31.)

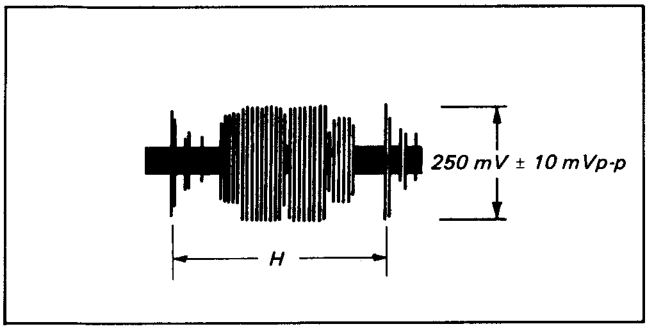


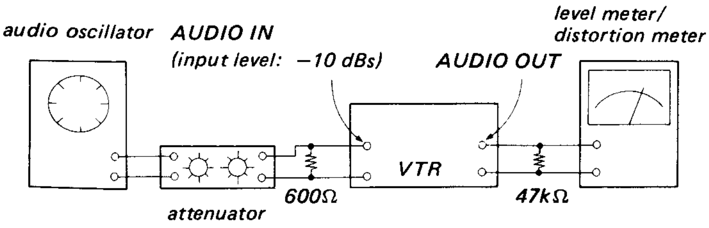
*Fig. 5-31. Chroma record current adjustment*

## 5-5. AUDIO SYSTEM ADJUSTMENT (AM-3 Board)

Use a Dynamicron tape for adjustments.

**[Connection of Related Equipment]**

**Note:** Set the INPUT SELECT switch to LINE.
Set the TONE switch to HIGH.



**[Adjustment method]**

1. ACE head adjustment... See "Mechanical Adjustment"
2. Playback frequency characteristic adjustment
3. Playback output level adjustment
4. Bias oscillator check
5. Record bias adjustment
6. Record current adjustment
7. Overall frequency characteristic check
8. AGC output check
9. Overall S/N check
10. Overall distortion check

**1. ACE Head Adjustment**

Refer to "Mechanical Adjustment"

**2. Playback Frequency Characteristic Adjustment**

(1) Play back 333 Hz and 5 kHz from the alignment tape and adjust so that the level difference between 333 Hz and 5 kHz is within 0 dB ± 1 dB with RV503.

**3. Playback Output Level Adjustment**

(1) Play back 333 Hz from the alignment tape and adjust so that the output level is −30 dBs ± 0.5 dB with RV502.

**4. Bias Oscillator Check**

(1) Set the input signal level to zero and set up the RECORD mode.
(2) Connect a frequency counter to Pin ② of CN504. The reading should be 65 kHz ± 6.5 kHz. (See Fig. 5-32.)

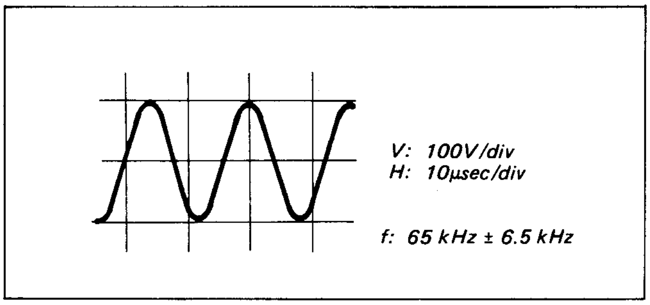


*Fig. 5-32. Bias oscillator check*

**5. Record Bias Adjustment**

Check that "Playback frequency characteristic adjustment" has been made.

(1) Connect TP506 and TP505 (GND) with a jumper wire so as to turn off the AGC operation.
(2) Supply a 333 Hz signal.
(3) Set up the E-E mode and adjust the oscillator output level so that the level meter reading is −30 dBs.
(4) Record signals.
(5) Supply a frequency of 7 kHz and perform Steps (3) and (4) above.
(6) Play back the recorded section of the tape and check that the output level at 7 kHz is ±1 dB relative to the output level at 333 Hz. If the level is outside this range, repeat Steps (2) through (5) adjusting with CT501 until the standard is met.
(7) Remove the jumper wire after making the adjustment.

**6. Record Current Adjustment**

(1) Supply a 333 Hz signal at −10 dBs.
(2) Record signals.
(3) Play back the recorded section of the tape and check that the output level is −9 dBs ± 1 dB. If the level is outside this range, repeat Steps (1) through (2) above adjusting with RV501 until the standard value is obtained.

### 7. Overall Frequency Characteristic Check

(1) Connect TP506 and TP505 (GND) with a jumper wire so as to turn off the AGC operation.
(2) Connect a 333 Hz signal.
(3) Set up the E-E mode and adjust the oscillator output level so that the level meter reading is −30 dBs.
(4) Record signals.
(5) Change the frequency to 50 Hz, 100 Hz, 7 kHz and 10 kHz and repeat Steps (3) and (4).
(6) Play back the recorded section of the tape and verify that the level is within the specification. (See Fig. 5-33.)

Standard values: With reference to the 333 Hz playback output level.

50 Hz $^{+2.5}_{-6}$ dB

100 Hz $^{+2.5}_{-3}$ dB

7 kHz $^{+2.5}_{-2.5}$ dB

10 kHz $^{+2.5}_{-10}$ dB

(7) If the specified values cannot be attained, perform 2 again. "Playback Frequency Characteristic Adjustment" and "Record Bias Adjustment".
(8) Remove the jumper wire after making the adjustment.

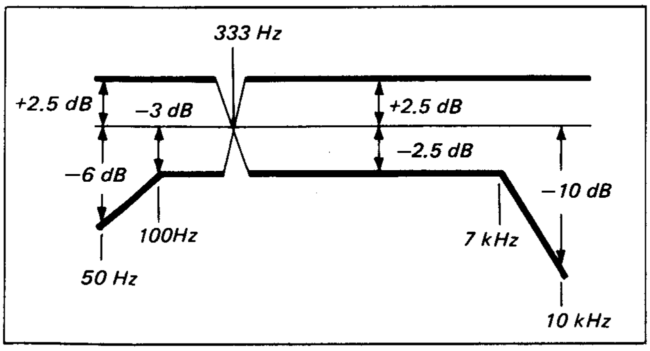


*Fig. 5-33. Overall frequency characteristic*

### 8. AGC Output Check

(1) Connect a 333 Hz signal at −10 dBs.
(2) Set up the E-E mode.
(3) Check that the output level is −10 dBs$^{+2}_{-3}$ dB.

### 9. Overall S/N Check

(1) Supply a 333 Hz signal at −10 dBs.
(2) Record signals.
(3) Set the input signal level to zero and record signals.
(4) Play back the recorded section of the tape and check that the output level difference is greater than 38 dB.

### 10. Overall Distortion Check

(1) Supply a 333 Hz signal at −10 dBs.
(2) Record signals.
(3) Play back the recorded section of the tape and verify that the distortion is below 4%.

## 5-6. TUNER SYSTEM ADJUSTMENT (TU-39 Board)

### 1) Tuner AGC Adjustment

(1) Set the DX/LOCAL switch on the rear panel to DX.
(2) Input RF signals (UHF channel,61 dB μ/75Ω open) from a colour bar generator, etc.
(3) Connect a digital voltmeter to TP001 (Pin ④ of IC001).
(4) Adjust RV001 to 7.2V ± 0.1V dc.

### 2) AFT Adjustment

(1) Set RV002 to the mechanical center.
(2) Input RF signals, and adjust PRESET VR finely for the best picture quality, while watching the monitor screen.
(3) Push the AFT switch to turn on the AFT function, and make the following adjustments.
(4) Connect a digital voltmeter to pin ⑤ of IC001.
(5) Adjust T005 to 6V dc.
(6) Connect a digital voltmeter across pins ⑤ and ⑥ of IC001.
(7) Adjust RV002 to 0V ± 0.25V dc.

## 5-7. TIMER SYSTEM ADJUSTMENT (TM-37 Board)

### 1) Clock Adjustment

(1) Connect a time interval counter to TP001.
(2) Adjust to 15624.85 μsec ± 0.05 μsec with TC001.

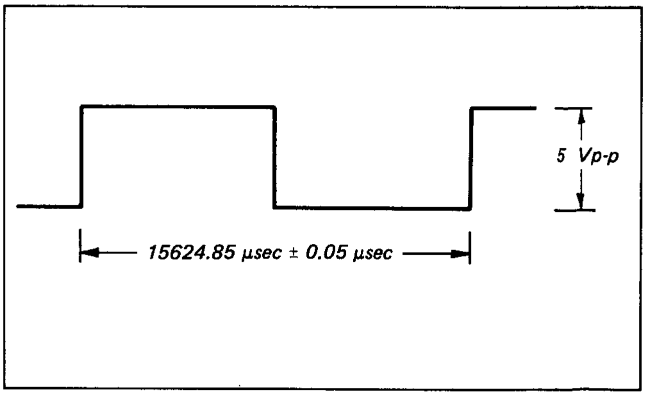
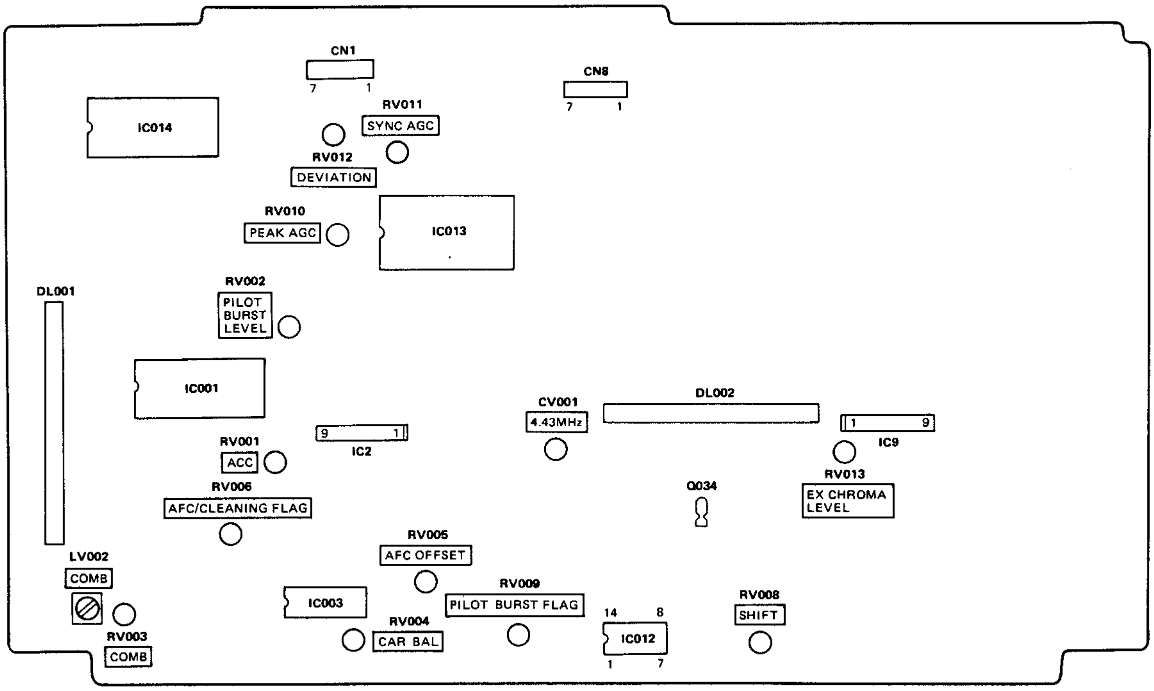
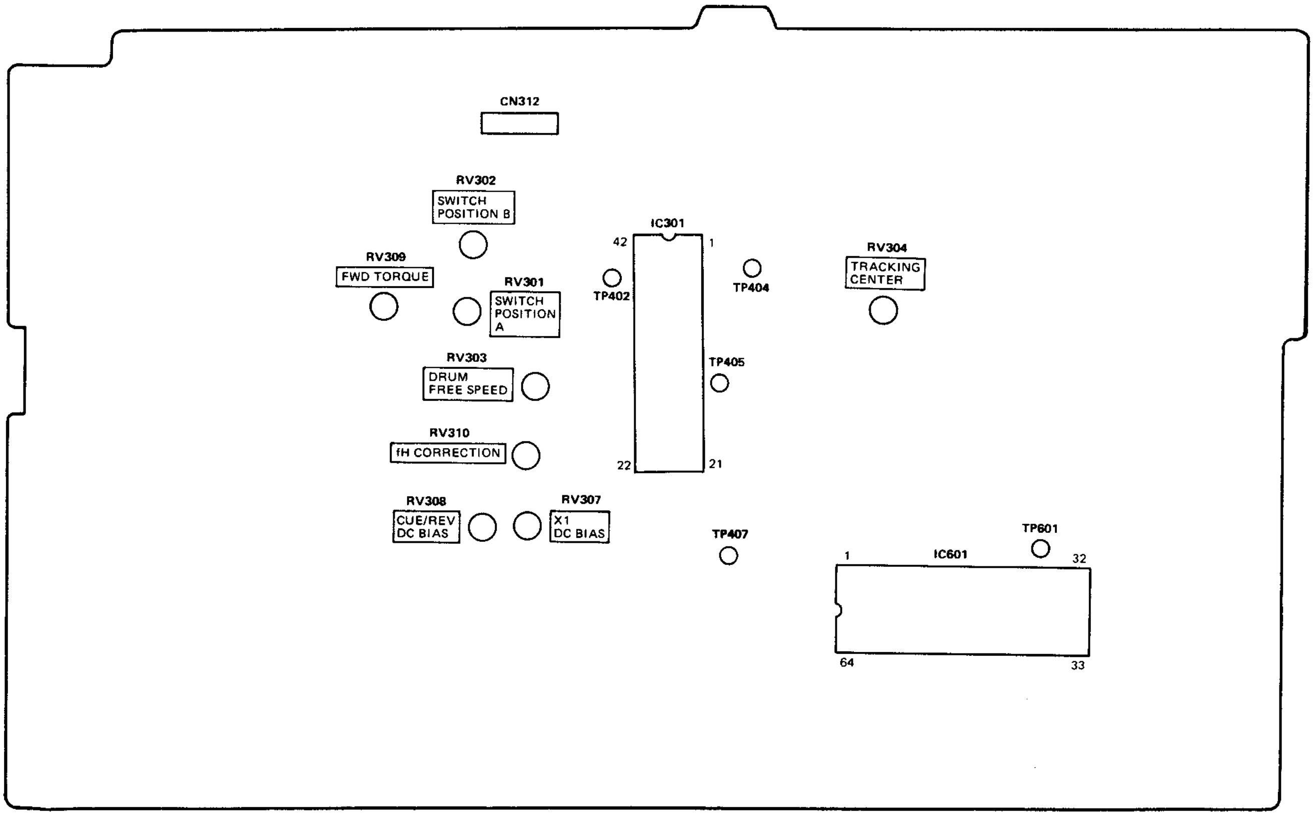


*Fig. 5-34. Clock adjustment*

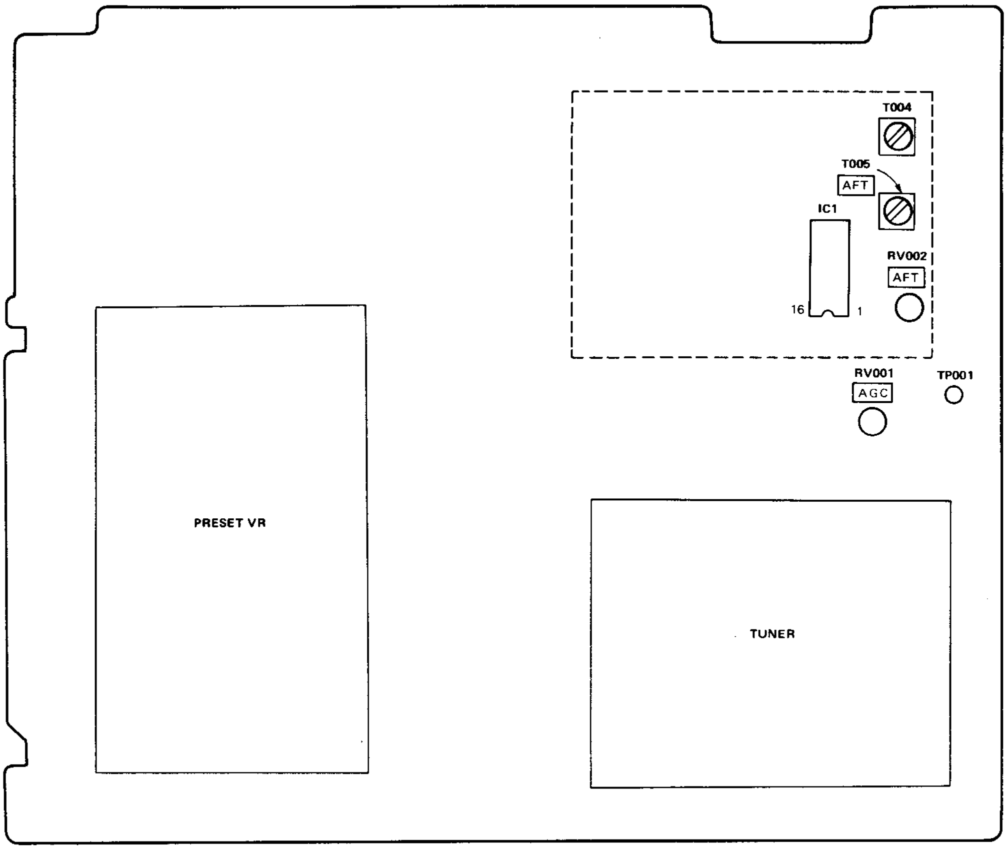
## YC-25 BOARD – COMPONENT SIDE –


CN1
7
1
CN8
7
1
IC014
RV011
SYNC AGC
RV012
DEVIATION
RV010
PEAK AGC
IC013
DL001
RV002
PILOT BURST LEVEL
IC001
CV001
4.43MHz
DL002
9
1
IC2
1
9
IC9
RV001
ACC
RV013
EX CHROMA LEVEL
RV006
AFC/CLEANING FLAG
Q034
RV005
AFC OFFSET
LV002
COMB
RV009
PILOT BURST FLAG
IC003
RV008
SHIFT
14
8
IC012
1
7
RV004
CAR BAL
RV003
COMB

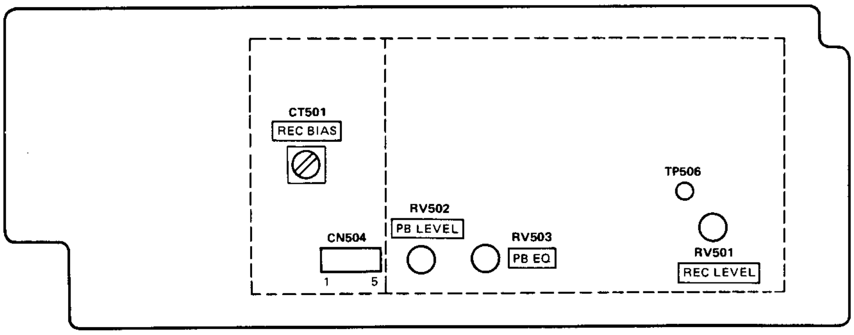
## SS-16 BOARD – CONDUCTOR SIDE –


CN312
RV302
SWITCH POSITION B
IC301
42
1
RV309
FWD TORQUE
RV301
SWITCH POSITION A
TP402
TP404
RV304
TRACKING CENTER
RV303
DRUM FREE SPEED
TP405
RV310
fH CORRECTION
22
21
RV308
CUE/REV DC BIAS
RV307
X1 DC BIAS
TP407
TP601
1
IC601
32
64
33

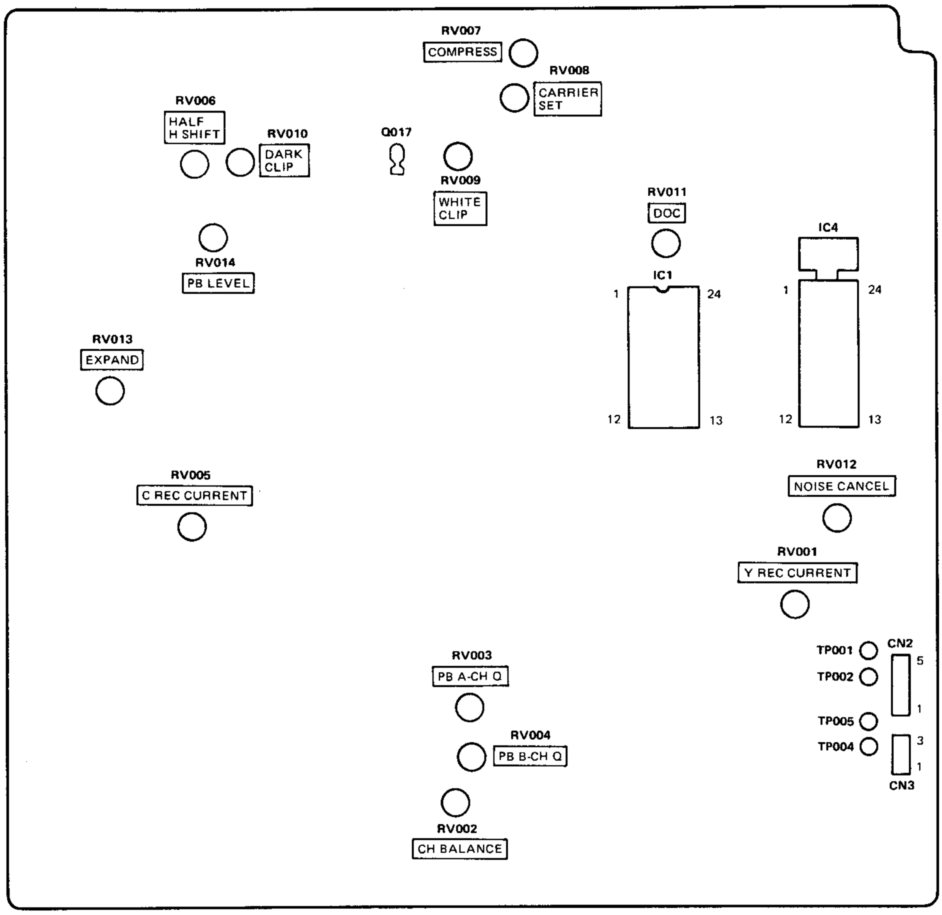
## TU-39 BOARD – COMPONENT SIDE –


T004
T005
AFT
IC1
RV002
AFT
16
1
RV001
AGC
TP001
PRESET VR
TUNER

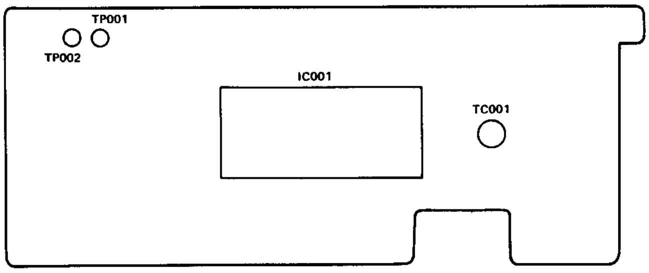
## AM-3 BOARD – COMPONENT SIDE –


CT501
REC BIAS
TP506
RV502
PB LEVEL
CN504
RV503
PB EQ
RV501
REC LEVEL
1
5

## RY-1 BOARD – COMPONENT SIDE –


RV007
COMPRESS
RV008
CARRIER SET
RV006
HALF H SHIFT
RV010
DARK CLIP
Q017
RV009
WHITE CLIP
RV011
DOC
IC4
RV014
PB LEVEL
IC1
1
24
1
24
RV013
EXPAND
12
13
12
13
RV005
C REC CURRENT
RV012
NOISE CANCEL
RV001
Y REC CURRENT
TP001
CN2
5
TP002
1
RV003
PB A-CH Q
TP005
TP004
3
1
CN3
RV004
PB B-CH Q
RV002
CH BALANCE

## TM-37 BOARD – COMPONENT SIDE –


TP001
TP002
IC001
TC001

English
83G0990-1
Printed in Japan

© 1983

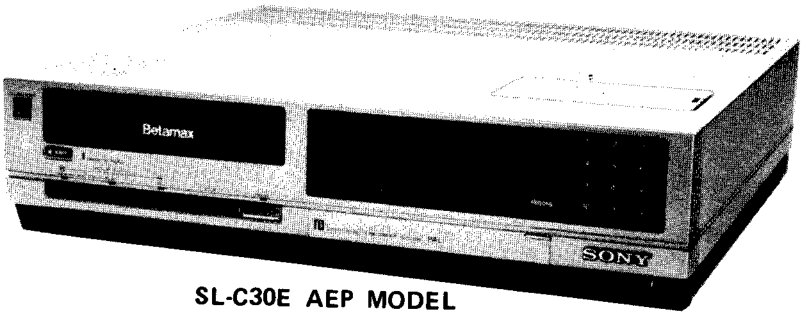
9-972-245-81

**Sony Corporation**

# SL-C30E/C30UB

# OPERATION MANUAL

*AEP Model*
*UK Model*
*E Model*



SL-C30E AEP MODEL

**711B** CHASSIS

November, 1983

Beta
VIDEO CASSETTE RECORDER
SONY®

MICROFILM

Consumer
VIDEO

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# CIRCUIT DESCRIPTION

## 1. VIDEO CIRCUIT

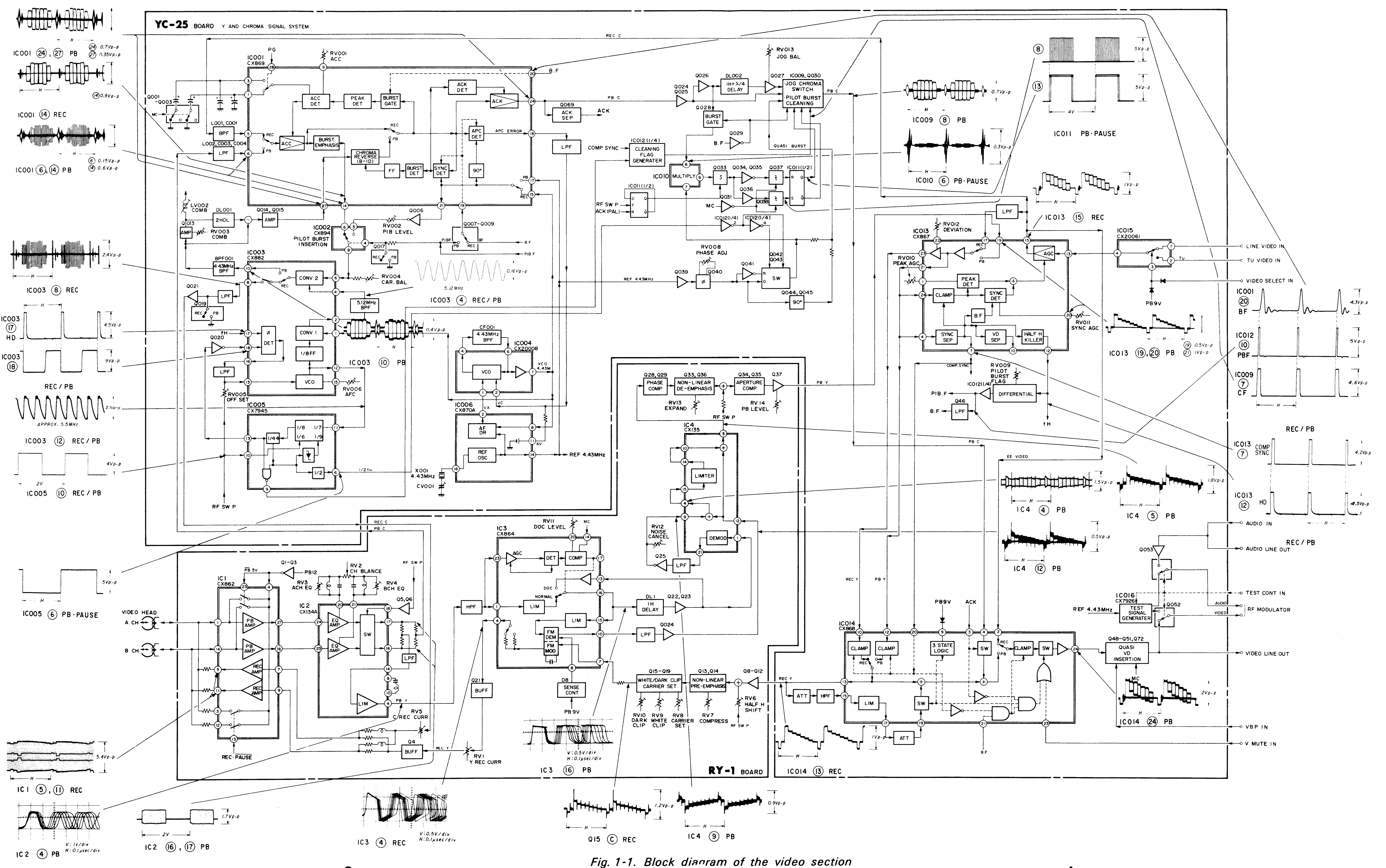

YC-25 BOARD Y AND CHROMA SIGNAL SYSTEM
RY-1 BOARD
IC001 CX869
IC002 CX894 PILOT BURST INSERTION
IC003 CX882
IC004 CX20008
IC005 CX7945
IC006 CX870A
IC009, Q030 JOG CHROMA SWITCH PILOT BURST CLEANING
IC010 MULTIPLY
IC011(1/2)
IC012(1/4) CLEANING FLAG GENERATER
IC013 CX867
IC014 CX868
IC015 CX20061
IC016 CX7926 TEST SIGNAL GENERATER
IC1 CX862
IC2 CX134A
IC3 CX864
IC4 CX135
ACC DET
PEAK DET
BURST GATE
ACK DET
ACK SEP
BURST EMPHASIS
CHROMA REVERSE (B-ID)
APC DET
SYNC DET
LPF
BPF
2HDL
AMP
CONV 2
CONV 1
1/8FF
VCO
5.12MHz BPF
4.43MHz BPF
AF DR
REF OSC
REF 4.43MHz
X001 4.43MHz
CV001
RV001 ACC
RV002 PIB LEVEL
RV003 COMB
LV002 COMB
RV004 CAR. BAL
RV005 OFF SET
RV006 AFC
RV008 PHASE ADJ
RV009 PILOT BURST FLAG
RV010 PEAK AGC
RV011 SYNC AGC
RV012 DEVIATION
RV013 JOG BAL
Q028 BURST GATE
DL002 1H+λ/4 DELAY
PHASE COMP
NON-LINEAR DE-EMPHASIS
APERTURE COMP
RV13 EXPAND
RV14 PB LEVEL
RV12 NOISE CANCEL
LIMITER
DEMOD
DIFFERENTIAL
CLAMP
SYNC SEP
VD SEP
HALF H KILLER
AGC
3 STATE LOGIC
SW
QUASI VD INSERTION
RV11 DOC LEVEL
DET
COMP
LIM
FM DEM
FM MOD
HPF
BUFF
DL1 1H DELAY
SENSE CONT
WHITE/DARK CLIP CARRIER SET
NON-LINEAR PRE-EMPHASIS
RV10 DARK CLIP
RV9 WHITE CLIP
RV8 CARRIER SET
RV7 COMPRESS
RV6 HALF H SHIFT
RV1 Y REC CURR
RV5 C/REC CURR
RV2 CH BLANCE
RV3 ACH EQ
RV4 BCH EQ
PB AMP
REC AMP
EQ AMP
ATT
VIDEO HEAD A CH B CH
LINE VIDEO IN
TU VIDEO IN
VIDEO SELECT IN
AUDIO IN
AUDIO LINE OUT
TEST CONT IN
RF MODULATOR
VIDEO LINE OUT
VBP IN
V MUTE IN
IC001 ㉔, ㉗ PB
IC001 ⑭ REC
IC001 ⑥, ⑭ PB
IC003 ⑧ REC
IC003 ⑰ HD
IC003 ⑱
REC / PB
IC003 ⑫ REC / PB
IC005 ⑩ REC / PB
IC005 ⑥ PB · PAUSE
IC003 ④ REC / PB
IC003 ⑩ PB
IC009 ⑧ PB
IC010 ⑥ PB · PAUSE
IC011 PB · PAUSE
IC013 ⑮ REC
IC013 ⑲, ⑳ PB
IC001 ⑳ BF
IC012 ⑩ PBF
IC009 ⑦ CF
IC013 ⑦ COMP SYNC
IC013 ⑫ HD
IC4 ④ PB
IC4 ⑤ PB
IC4 ⑫ PB
IC014 ㉔ PB
IC014 ⑬ REC
IC1 ⑤, ⑪ REC
IC2 ④ PB
IC2 ⑯, ⑰ PB
IC3 ④ REC
IC3 ⑯ PB
Q15 Ⓒ REC
IC4 ⑨ PB

Fig. 1-1. Block diagram of the video section

### 1-1. Outline

The video block is configured of the 2 PC boards YC-25 and RY-1 and each board is provided with the circuits shown below.

YC-25 board : Video IN/OUT, AGC, Chroma System
RY-1 board : Head Amp, Y System

Although the circuit structure is the same as that in SL-F1E and SL-C9E, it possesses the following features.

- HIC is no longer used and discrete components are used instead.
- I/O (RFT) transformerless recording and playback
- Drop out corrections are carried out with RF signals.

### 1-2. Input/Output Signals

The input signal is supplied from TUNER and LINE systems. The output signal is supplied from RF OUT and LINE systems and changed over into a TEST signal by using an RF OUT terminal.

### 1-3. Input Circuit

The line input signal is fed to pin ⑦ of IC015 (CX-20061) and, as the tuner input signal is fed to pin ②, either of the TUNER or LINE system can be selected by supplying a VIDEO SELECT signal to pin ③.

| ③ PIN | CONECTION | INPUT |
|---|---|---|
| H | ② — ④ | TUNER VIDEO |
| L | ⑦ — ④ | LINE IN |

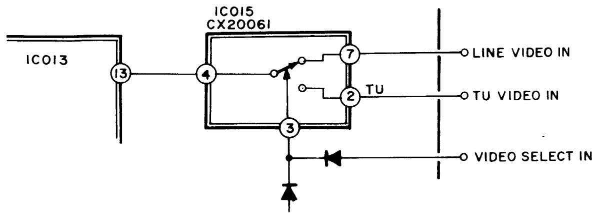

IC013
⑬
IC015
CX20061
④
⑦
TU
②
③
LINE VIDEO IN
TU VIDEO IN
VIDEO SELECT IN

*Fig. 1-2.*

### 1-4. Output Circuit

The signals from pin ㉔ of IC014 are output via output circuits Q048 through Q052.
In the normal mode, the signal is passed through the buffer of Q050 and is sent to a LINE OUT terminal and RF modulator. As a VBP signal is applied to the base of Q048 during variable-speed PB (MC signal in "H") and a bias is applied to Q049 with the MC signal, the video signal containing a quasi VD signal is obtained. The tip of the VD signal will become a SYNC tip level of the video signal through Q051.
The TEST CONT signal will be applied to pin ⑥ of IC016 during TEST signal ON and will generate B/W pictures and 400 Hz audio. This picture signal passes through Q052 and enters an RF OUT modulator. This IC016 (CX-7926) acts as a test signal generator during TV tuning and creates SYNC, VIDEO and TONE signals by count-down of the 4.43 MHz input from pin ⑦. Although both SYNC and VIDEO signals are synchronized, they are applied to Q052 after mixing with resistors as they are output from separate pins.

### 1-5. E-E System

The signals from pin ④ of IC015 enter pin ⑬ of IC013 (CX867) and, after being subjected to AGC, are output in the order of pin ⑮ to pin ② of IC014 (CX868) to pin ㉔ of this IC. The AGC operation will be explained with the REC mode. The E-E signal from pin ② of IC014 and the PB signal, after Y/C mix, are output from pin ㉔ after passing through the clamp circuit and amp circuit. A direct E-E system is used. (Refer to Fig. 1-4.)

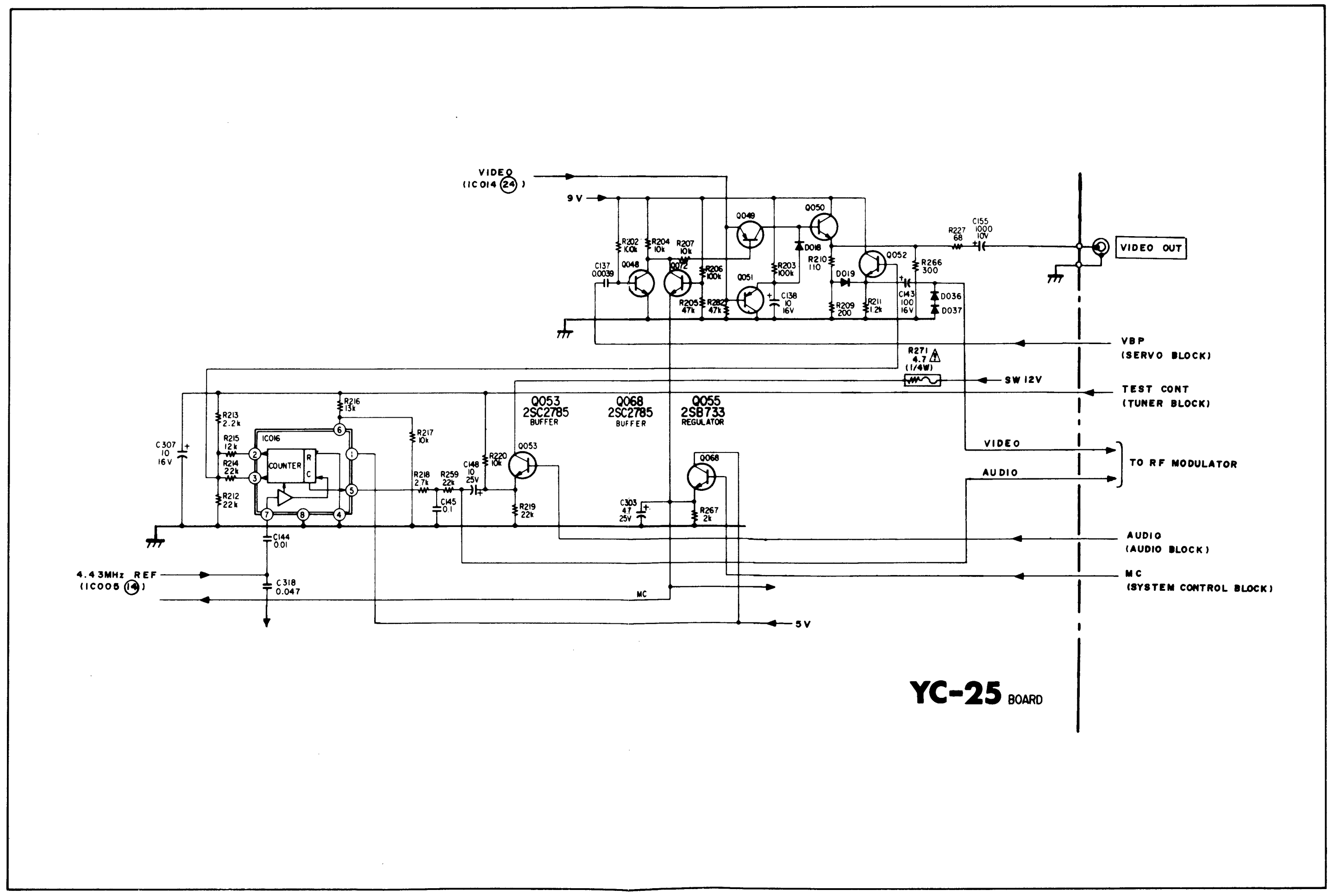

VIDEO
(IC014 ㉔)
9V
Q049
Q050
R202 10k
R204 10k
R207 10k
C137 0.0039
Q048
Q072
R206 100k
Q051
R203 100k
D018
R210 110
Q052
R227 68
C155 1000 10V
VIDEO OUT
R205 47k
R282 47k
C138 10 16V
D019
R209 200
R211 1.2k
R266 300
C143 100 16V
D036
D037
VBP
(SERVO BLOCK)
R271 4.7 (1/4W)
SW 12V
TEST CONT
(TUNER BLOCK)
Q053 2SC2785 BUFFER
Q068 2SC2785 BUFFER
Q055 2SB733 REGULATOR
R216 13k
R213 2.2k
R215 12k
R214 22k
R212 22k
C307 10 16V
IC016
COUNTER
R
C
②
③
⑥
①
⑤
⑦
⑧
④
R217 10k
R218 2.7k
R259 22k
C145 0.1
C148 10 25V
R220 10k
Q053
R219 22k
C303 4.7 25V
Q068
R267 2k
VIDEO
AUDIO
TO RF MODULATOR
AUDIO
(AUDIO BLOCK)
MC
(SYSTEM CONTROL BLOCK)
C144 0.01
4.43MHz REF
(IC005 ⑭)
C318 0.047
MC
5V
YC-25 BOARD

*Fig. 1-3. Output circuit*

### 1-6. Y (Luminance) Signal REC System

The signal entering the AGC Amp from pin ⑬ of IC013 appear at pin ⑮. While passing through this route, the signal is subjected to AGC. After being subjected to AGC, the output of pin ⑮ is split with one becoming the REC-C signal which passes through BPF and enters pin ⑤ of IC001 (CX869). The other signal that becomes REC-Y passes through LPF from pin ⑮ and enters pin ⑰ after its chroma components have been removed and then enters the amplifier.
The amplified PB signal is output from pin ㉑ and the REC signal is output from pin ㉓ after entering the DEVIATION amp. The DC voltages entering the PRE-EMPHASIS circuit are maintained at a constant value by using RV012. (Refer to Fig. 1-4.)
Fig. 1-5 is a block diagram of the SYNC SEP section broken down further.
HD, VD, and BURST FLAG signals are created by the signals entering after passing through the LPF. As the signals changes due to the DC position of the lead SYNC (APL), this position is detected first. Ripples are than removed by the clamp slicer to prevent over-input and thus maintain the SYNC section at a constant value. The BURST FLAG signal is used for AGC detection of the SYNC signal.
The signal from pin ㉓ of IC013 enters pin ⑩ of IC014 (CX868) and passes through the clamp circuit. The signal then through the SW controlled by the voltage on pin ⑨ and enters the noise canceller. During REC however, the signal from pin ⑨ will bypass the noise canceller and will appear at pin ⑬. SW will be switched to PB when the voltage on pin ⑨ is over 6V and REC when it is under 6V. The output signal from pin ⑬ is fed from YC-25 board to RY-1 board and enters the PRE-EMPHASIS circuit. (Refer to Fig. 1-4.)
The signal entering RY-1 board enters the PRE-EMPHASIS block composed of transistors Q008 through Q019, where various adjustments are carried out such as 1/2 fH-shifts, compression, carrier settings and white/dark clippings.
Adjustments of the carrier frequency setting and frequency deviation of the modulator are carried out at a DC point of the modulator input by gain control. The frequency deviation is adjusted by changing the gain of a diviation amplifier of IC013 pin ㉓ on the YC-25 board and the carrier frequency by changing the collector current of Q015.
The signal entering pin ⑦ of IC003 (CX864) will be FM modulated so the SYNC tip will be 3.8 MHz and WHITE 100% will be 5.2 MHz. The FM modulated Y signals are mixed with low-converted chroma signals and are recorded on tape. After adjusting the FM modulated signals to the prescribed recording current, they are divided into channels A and B by means of resistors. Upon completion of Y/C mix, the signals then enter pins ⑦ and ⑨ of IC001 (CX862) and are supplied to the video head after being amplified in the head amplifier.

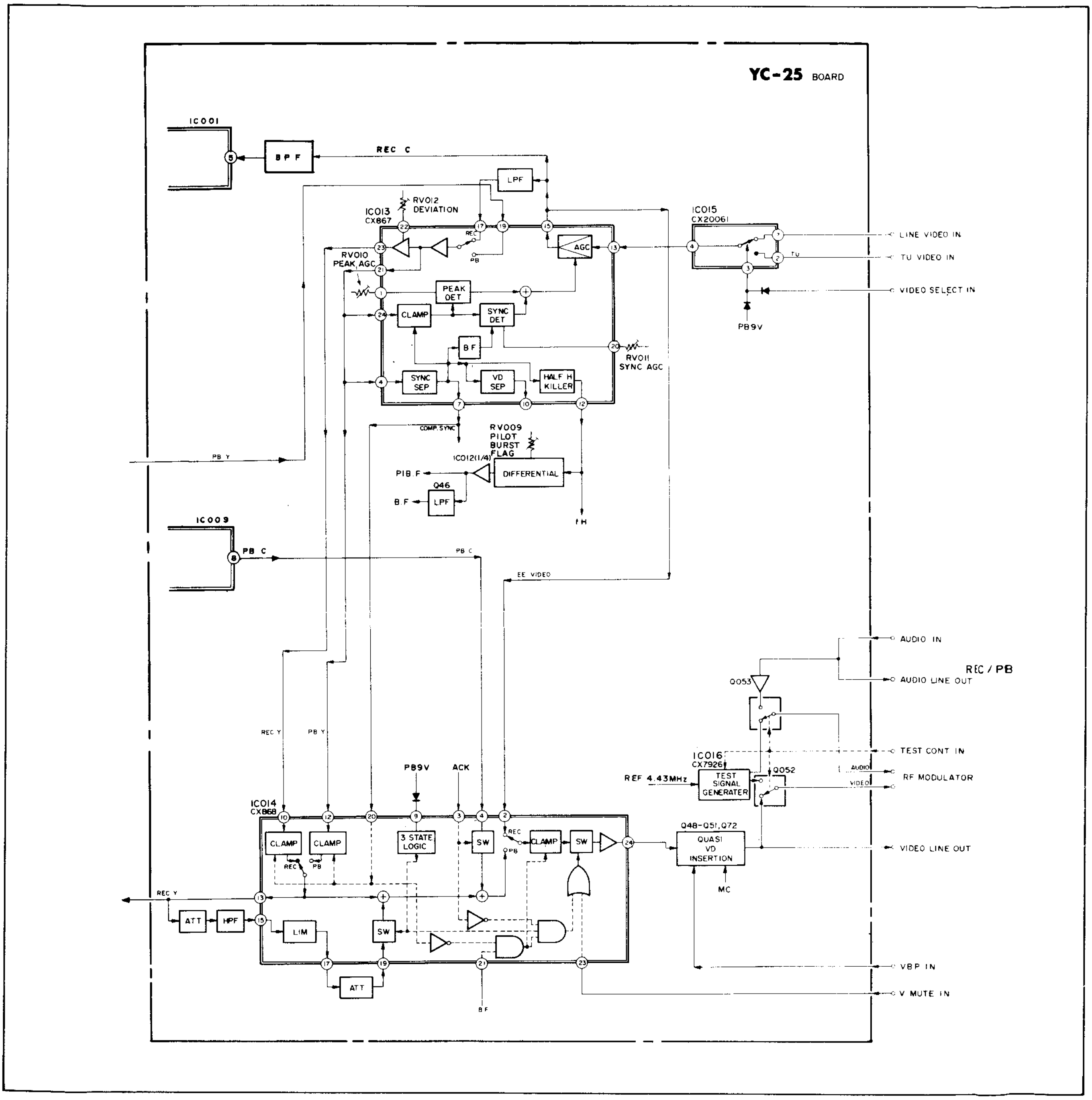

YC-25 BOARD
IC001
BPF
REC C
LPF
RV012
DEVIATION
IC013
CX867
REC
PB
AGC
RV010
PEAK AGC
PEAK DET
CLAMP
SYNC DET
B F
RV011
SYNC AGC
SYNC SEP
VD SEP
HALF H KILLER
COMP. SYNC
RV009
PILOT
BURST
FLAG
IC012(1/4)
DIFFERENTIAL
PIB.F
Q46
B.F
LPF
f H
PB Y
IC009
PB C
PB C
EE VIDEO
IC015
CX20061
TU
LINE VIDEO IN
TU VIDEO IN
VIDEO SELECT IN
PB9V
AUDIO IN
REC / PB
AUDIO LINE OUT
Q053
TEST CONT IN
IC016
CX7926
REF 4.43MHz
TEST SIGNAL GENERATER
Q052
AUDIO
VIDEO
RF MODULATOR
Q48-Q51, Q72
QUASI VD INSERTION
MC
VIDEO LINE OUT
VBP IN
V MUTE IN
REC Y
PB Y
PB9V
ACK
IC014
CX868
CLAMP
CLAMP
REC
PB
3 STATE LOGIC
SW
REC
PB
CLAMP
SW
REC Y
ATT
HPF
LIM
SW
ATT
B F

*Fig. 1-4.*

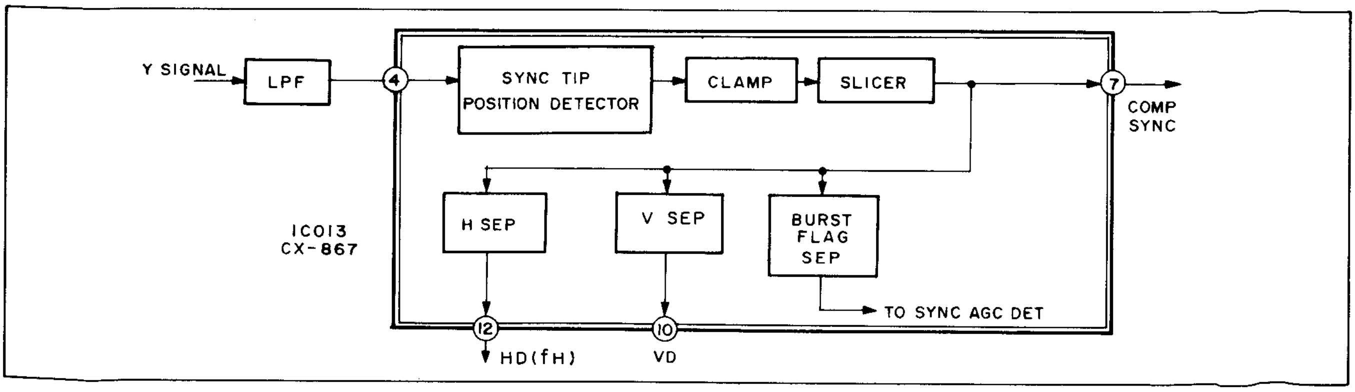

Y SIGNAL
LPF
SYNC TIP POSITION DETECTOR
CLAMP
SLICER
COMP SYNC
H SEP
V SEP
BURST FLAG SEP
IC013
CX-867
TO SYNC AGC DET
HD(fH)
VD

*Fig. 1-5.*

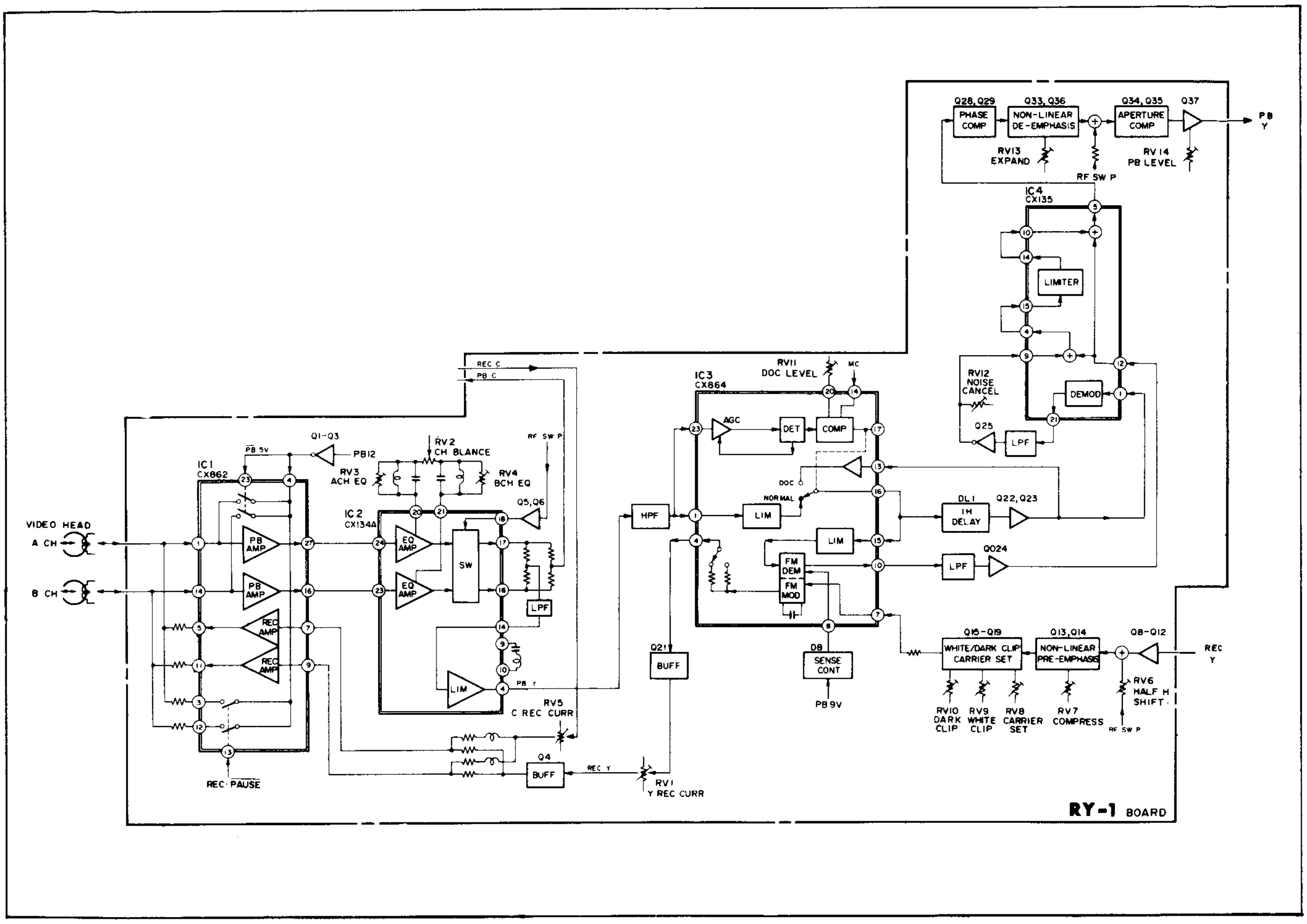

VIDEO HEAD
A CH
B CH
IC1 CX862
PB 5V
Q1-Q3
PB12
RV2 CH BLANCE
RV3 ACH EQ
RV4 BCH EQ
RF SW P
Q5,Q6
IC2 CX134A
PB AMP
REC AMP
EQ AMP
SW
LPF
LIM
PB Y
RV5 C REC CURR
REC PAUSE
Q4
BUFF
REC Y
RV1 Y REC CURR
REC C
PB C
HPF
Q21
BUFF
IC3 CX864
RV11 DOC LEVEL
MC
AGC
DET
COMP
DOC
NORMAL
LIM
FM DEM
FM MOD
D8
SENSE CONT
PB 9V
Q28,Q29
PHASE COMP
Q33,Q36
NON-LINEAR DE-EMPHASIS
Q34,Q35
APERTURE COMP
Q37
PB Y
RV13 EXPAND
RV14 PB LEVEL
RF SW P
IC4 CX135
LIMITER
RV12 NOISE CANCEL
DEMOD
Q25
LPF
DL1 1H DELAY
Q22,Q23
Q024
LPF
Q15-Q19
WHITE/DARK CLIP CARRIER SET
Q13,Q14
NON-LINEAR PRE-EMPHASIS
Q8-Q12
REC Y
RV6 HALF H SHIFT
RV10 DARK CLIP
RV9 WHITE CLIP
RV8 CARRIER SET
RV7 COMPRESS
RF SW P
RY-1 BOARD

*Fig. 1-6.*

## 1-7. Y (Luminance) Signal PB System

The signals entering from the video head enter IC002 (CX134A) after the respective inputs of channels A and B are amplified by the head amp of IC001 (CX862). The signals entering from channel A (pin ㉔ ) and channel B (pin ㉓ ) pass through the internal amplifier and enter the equalizer amplifier. The playback frequency characteristic is adjusted here and A/B channel balance is also adjusted at the same time. The equalizer output is then added to the switching circuit and an RF output, with the overlapped portion of the 2 channels removed, appears at pins ⑯ and ⑰ . The output is mixed by means of resistors and is used as PB-C and PB-Y signals. After being mixed, the PB-Y signal enters pin ⑭ through an LPF. The soft limiter is composed of an LPF, limiter for pin ⑭ to pin ④ and an HPF.

The output from pin ④ enters pin ① of IC003 (CX864) after passing through a HPF and, after passing through a limiter, enters the drop-out compensation switch (DOC switch) and is output from pin ⑯ . In SL-C30E/UB, the RF signal method was used to compensate for drop-outs. When there are no drop-outs, the output from pin ⑯ enter the IC again from pin ⑮ and are demodulated. The signals on pin ㉓ are used for drop-out detection.

Envelope detection is carried out on the RF signal input after applying AGC and bringing to a fixed level and the drop-out detecting position is determined by its relative ratio with the RF signal. If drop-outs exist, DO pulses are generated and the internal DDC switch is changed over to pin ⑬ on the compensating side.

1 Hour delayed elements of the output of pin ⑯ are applied to pin ⑬. The demodulated signals appearing on pin ⑩ pass through the LPF composed of L022 to 024 and C073 to 076 where the RF components are removed and the signals become the original video signals. This signal then enters the Y-COMB filter composed of IC004 (CX135). Crosstalk from the adjacent track is removed from the signal entering pin ⑫ and this signal is output from pin ⑤. (Refer to Fig. 1-7.) The signals appearing from the Y-COMB filter enter the de-emphasis circuit formed of Q028 to Q037. The signals first enter equalizer Q028 and Q029 where they are subjected to phase compensation. The signals are then returned to their original state by the de-emphasis circuit on the collector side of Q033 and the pair of diodes on the emitter side.

The signals from the de-emphasis circuit return to YC-25 board via RY-1 board and enter pin ⑲ of IC013 (CX867) and, after passing through the REC/PB switch, pass through the amplifier and appear at pin ㉑ as in the case of REC. (Refer to Fig. 1-4.)

This output then enters pin ⑫ of IC014 and, after passing through the noise cancelling circuit, is mixed with the chroma signal from pin ④ and is output from pin ㉔. With the insertion of a double time constant LPF into the LIMITER output as shown in Fig. 1-8, it will be possible to improve noise removal percentage by returning the phase slightly near the cut-off point of the HPF in this canceller and thus reduce smear and improve noise cancelling effects.

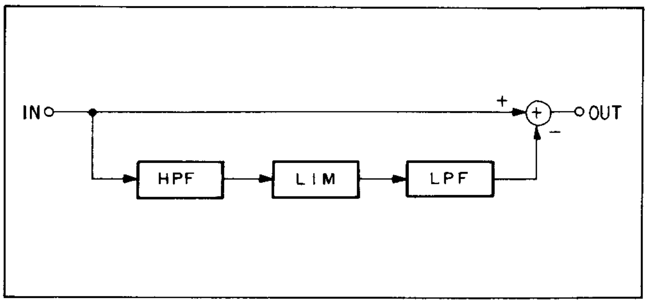

IN
+
OUT
−
HPF
LIM
LPF

*Fig. 1-8.*

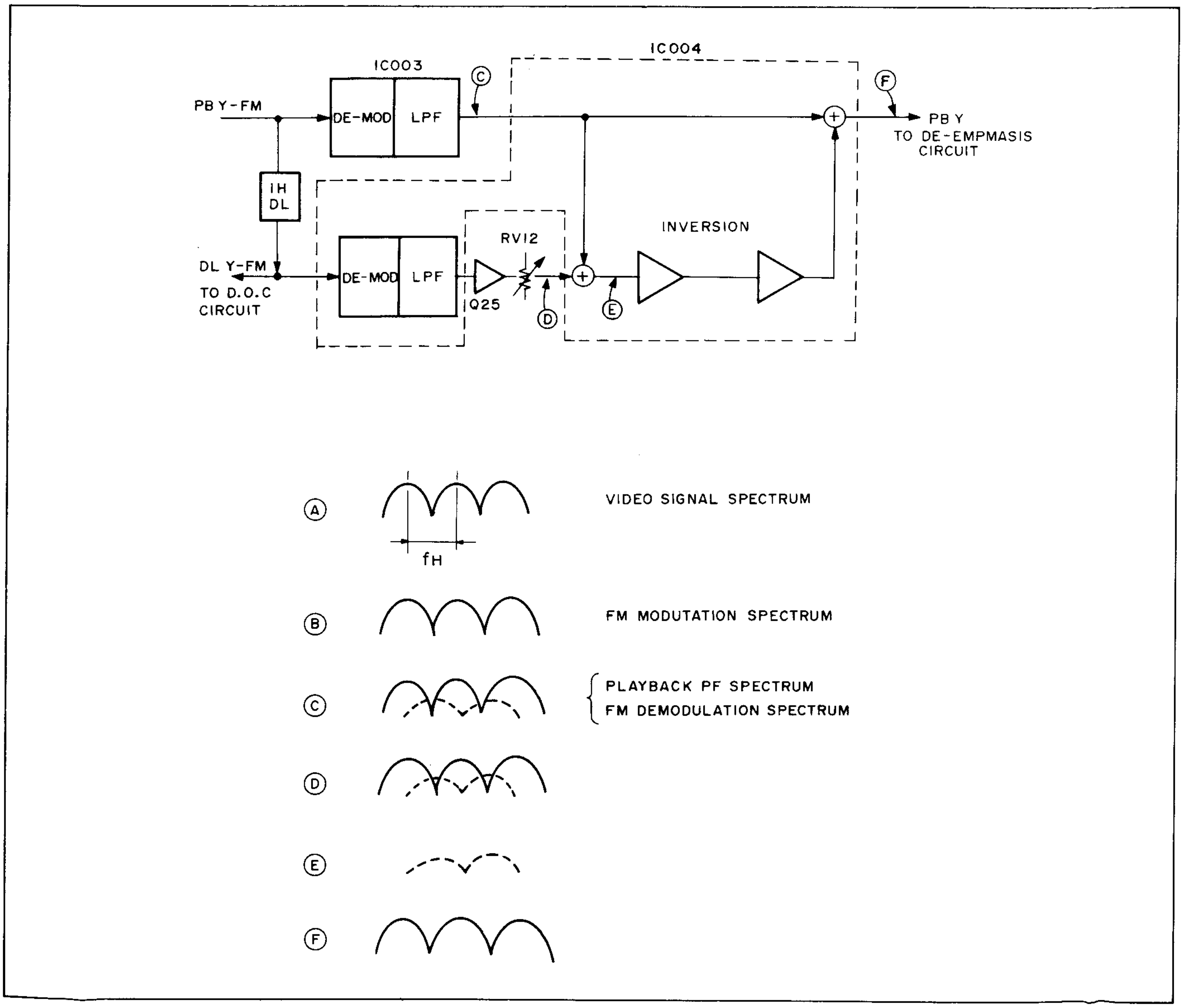

IC003
IC004
Ⓒ
Ⓕ
PB Y-FM
DE-MOD
LPF
PB Y
TO DE-EMPMASIS
CIRCUIT
1H
DL
RV12
INVERSION
DL Y-FM
TO D.O.C
CIRCUIT
DE-MOD
LPF
Q25
Ⓓ
Ⓔ
Ⓐ
fH
VIDEO SIGNAL SPECTRUM
Ⓑ
FM MODUTATION SPECTRUM
Ⓒ
PLAYBACK PF SPECTRUM
FM DEMODULATION SPECTRUM
Ⓓ
Ⓔ
Ⓕ

*Fig. 1-7.*

## 1-8. Chrominance Signal REC System

The signals appearing from the AGC amplifier of pin ⑮ of IC013 are split into the Y system and C system. Those that become chroma signals pass through the BPF and enter pin ⑤ of IC001 (CX869) as 4.43 MHz chroma signals only. This IC is a color processor around the ACC and its main functions are as follows.

ACC, ACK, APC, BURST-ID

Signals entering pin ⑤ pass through SW REC/PB and are set to the prescribed level after entering the ACC amplifier.
The ACC amplifier output is output from pin ⑭ and gain control of the ACC amplifier is carried out by the DC voltage from the capacitor connnected to pin ③. Although this voltage is such that error detection can be carried out for either channel A or channel B, only 1 channel is used during REC. (Pin ③ during REC and pins ① and ③ during PB)
During variable-speed PB, the time constant is changed over through transistors Q001 through Q003.

On one hand, phase detection is carried out on the APC with the 4.43 MHz VCO output (at pin ⑦ of IC004) and this output (at pin ⑱) is applied to the VCO (at pin ② of IC004) and AFDR (at pin ④ of IC006). As a result, a 4.43 MHz VCO output phase locked with burst can be obtained.
In addition, the ACC amplifier output is an APC loop that is also supplied to the SYNC Det. together with the 4.43 MHz VCO output phase locked by burst which first passes through the 90° shifter. Phase detection is carried out on these 2 burst portions only. If we consider the phase relation of the 2 in the SYNC DET, there will be a 90° phase difference between the APC DET burst signal (Ⓐ) and the 4.43 MHz output (Ⓑ) of the 90° shifter if the APC loop is properly locked (This will depend on phase detection characteristics.). The SYNC DET input burst signal (Ⓐ) and the 4.43 MHz signal (Ⓒ) will be of the same phase as there is a 90° phase difference between the 4.43 MHz (Ⓑ) of the 90° shifter and the 4.43 MHz (Ⓒ) to the SYNC DET.

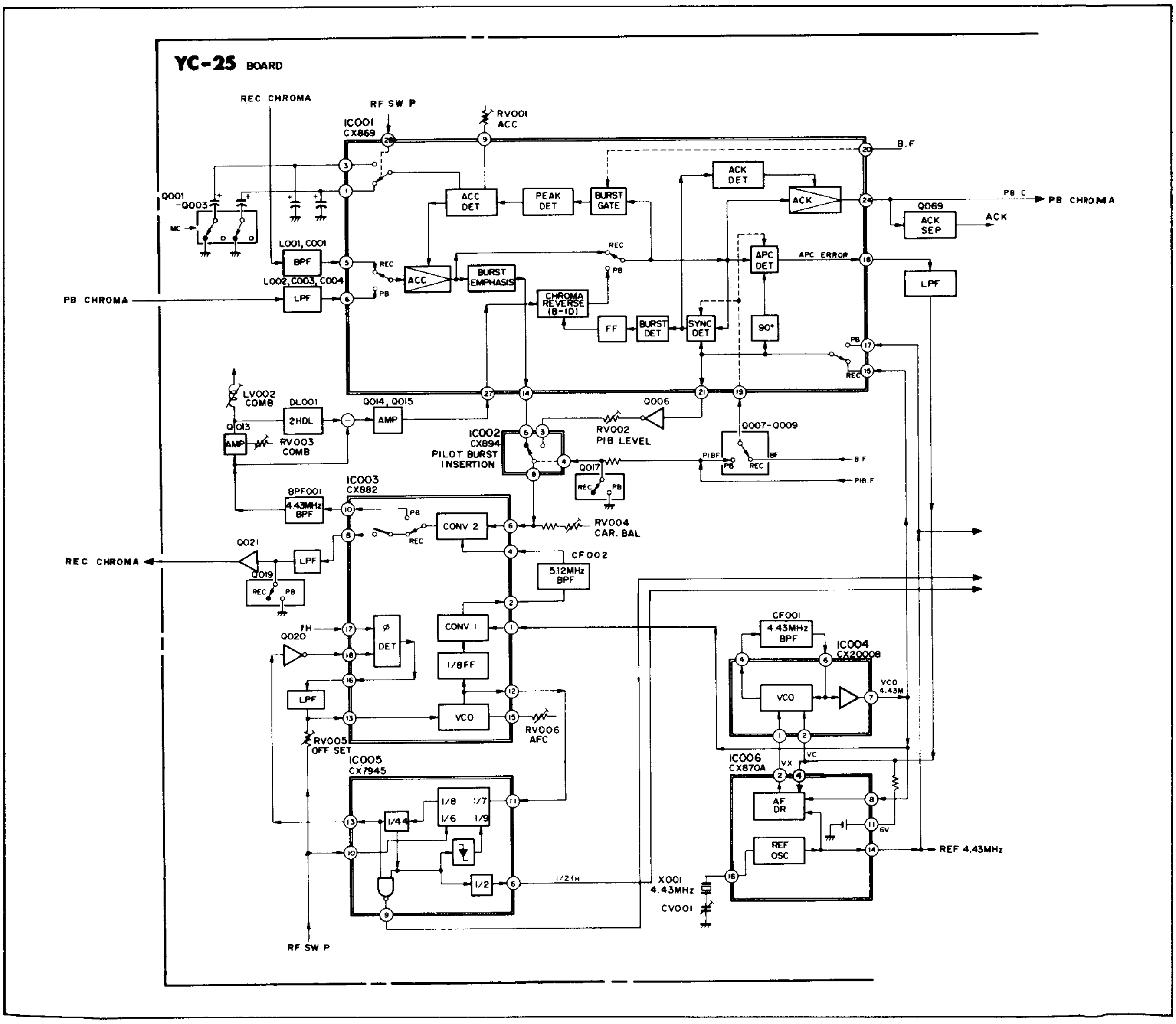

YC-25 BOARD
REC CHROMA
RF SW P
IC001
CX869
RV001
ACC
B.F
ACK DET
ACC DET
PEAK DET
BURST GATE
ACK
PB C
PB CHROMA
Q069
ACK SEP
ACK
Q001
-Q003
MC
L001, C001
BPF
L002, C003, C004
LPF
REC
PB
ACC
BURST EMPHASIS
CHROMA REVERSE (B-ID)
FF
BURST DET
SYNC DET
APC DET
APC ERROR
90°
LPF
PB CHROMA
LV002
COMB
DL001
2HDL
Q014, Q015
AMP
Q006
Q013
AMP
RV003
COMB
IC002
CX894
PILOT BURST
INSERTION
RV002
PIB LEVEL
Q007-Q009
PIBF
BF
B F
PIB.F
Q017
IC003
CX882
BPF001
4.43MHz BPF
CONV 2
RV004
CAR. BAL
Q021
LPF
REC CHROMA
Q019
CF002
5.12MHz BPF
fH
Q020
ø DET
CONV 1
1/8FF
VCO
LPF
RV005
OFF SET
RV006
AFC
CF001
4.43MHz BPF
IC004
CX20008
VCO
VCO 4.43M
IC005
CX7945
1/8 1/7
1/6 1/9
1/44
1/2
1/2fH
X001
4.43MHz
CV001
IC006
CX870A
VX
VC
AF DR
REF OSC
6V
REF 4.43MHz
RF SW P

Fig. 1-9.

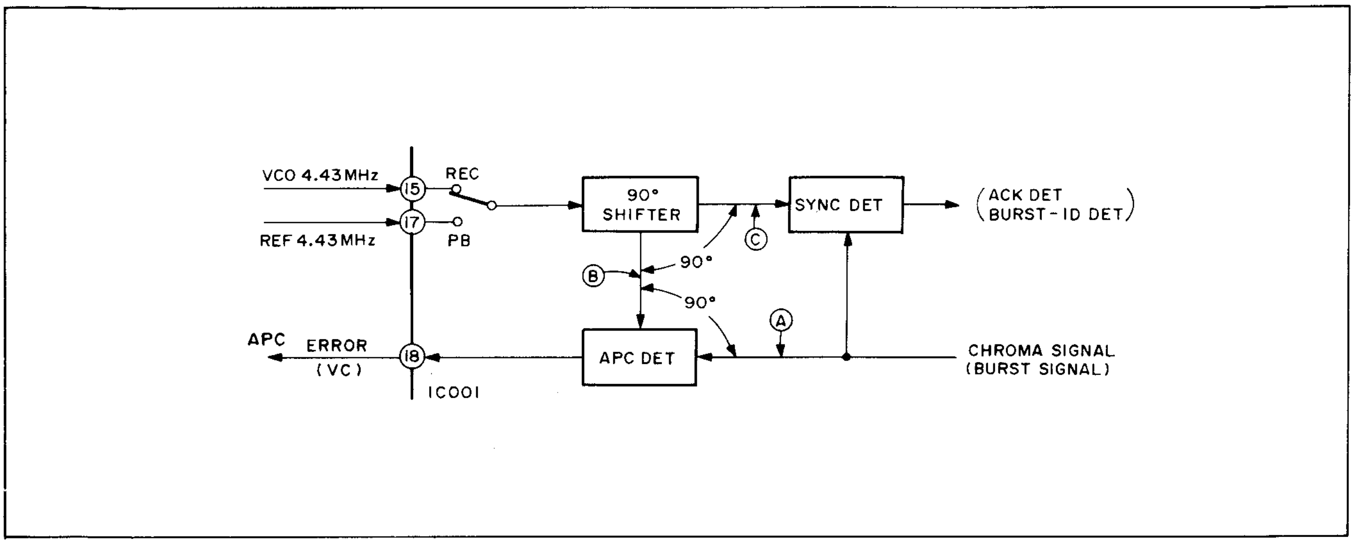

VCO 4.43MHz
REF 4.43MHz
⑮
⑰
REC
PB
90° SHIFTER
SYNC DET
(ACK DET BURST-ID DET)
Ⓒ
Ⓑ
90°
90°
Ⓐ
APC
ERROR (VC)
⑱
IC001
APC DET
CHROMA SIGNAL (BURST SIGNAL)

*Fig. 1-10.*

In the ACK function, if the DC voltage on which phase comparison was carried out by burst signal ( Ⓐ ) and VCO 4.43 MHz signal ( Ⓒ ) in the IC is greater than the reference voltage set in the IC, it will be output from pin ㉔ together with the chroma signal of the ACC output after passing through the ACK amplifier. Also, if the voltage is lower than the reference voltage, it will be grounded together with the chroma in the ACK amplifier.

After being mixed in IC002 (CX894) with the false burst signal (PILOT BURST) from pin ㉑ , the ACC amplifier output from pin ⑭ enters the frequency converter-2 of pin ⑥ of IC003 (CX882). After it is converted to low-converted chroma signal here, it enters the REC amplifier. (In RY-1 board after the LPF)

## 1-9. AFDR

IC006 (CX870A) is an IC possessing oscillation functions of the reference 4.43 MHz signals and AFDR (Automatic Frequency Drift Reject) functions of the VCO of IC004 (CX20008). Accurate 4.43 MHz frequency oscillations will be carried out by means of the crystal oscillator connected to pin ⑯. In addition to being used as an APC reference signal during playback, this signal is compared to the IC004 VCO output entering pin ⑧. The VCO error voltage (Vx) is output from pin ② and is returned to the VCO. In other words, the AFDR controls VCO so the center frequency of VCO will always match the reference frequency. IC004 (CX20008) is the IC with this VCO. This VCO generates 4.43 MHz while being controlled by Vc and Vx explained in the foregoing. Under AFDR control, center frequency fluctuations, including temperature characteristics, are maintained within ± 500 Hz without adjustment.

(Vc: Center frequency ontrol,
Vx: Phase control)

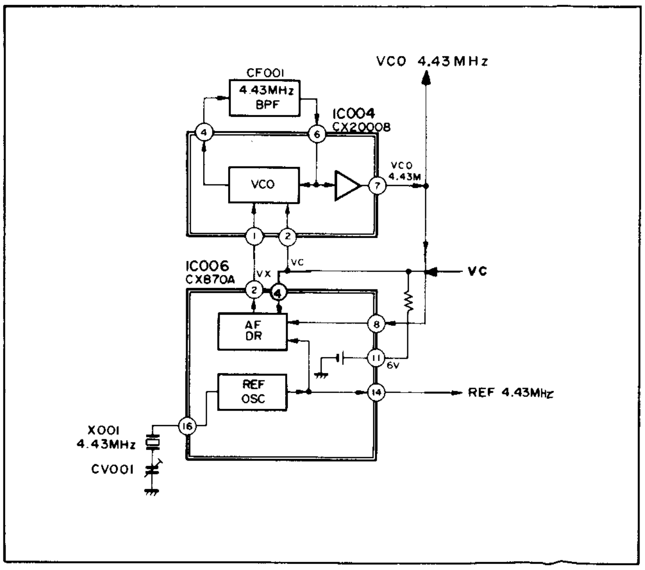

CF001
4.43MHz BPF
VCO 4.43MHz
IC004
CX20008
④
⑥
VCO
VCO 4.43M
⑦
①
②
IC006
CX870A
VX
VC
VC
②
④
AF DR
⑧
⑪
6V
REF OSC
⑭
REF 4.43MHz
⑯
X001
4.43MHz
CV001

*Fig. 1-11.*

## 1-10. AFC

For $\beta$-PAL system, a dual frequency method (corresponding to the PI system of ß-NTSC) is used to remove crosstalk and the oscillation frequency of VCO is set as follows to create this frequency.

Ch A = 8 × (44 − 1/8) $f_H$

Ch B = 8 × (44 + 1/8) $f_H$

In other words, Ch A = 351 $f_H$ and Ch B = 353 $f_H$

In the past, the CX7605 was used with the above respective values being 1/117 and 1/119 and AFC applied with 3 $f_H$ whereas, we now have the newly developed CX7945 (IC005). This IC divides the VCO into 1/351 and 1/353 by combinations of the 1/8, 1/7 and 1/9 divider and the 1/44 divider. This output (hereafter called FH) enters pin ⑱ of IC003 (CX882) and creates inclined waves. Samplings are taken by the differentiated $f_H$ (HD) signal from pin ⑰ and sampling hold voltages are output from pin ⑯. This voltage passes through the external LPF and enters pin ⑬ and becomes the VCO control voltage that locks the current of AFC, ADJ and RV (RV006) of pin ⑮ together with locking the VCO oscillation frequency to 351 and 353 times $f_H$.

We shall now describe IC005 (CX7945).

This IC is an AFC counter for the 3 systems of PAL, SECAM and NTSC and is used in the PAL mode in this machine.

The VCO signals entering pin ⑪ are divided 1/8, 1/9 and 1/7 by the RF switch pulse from pin ⑩ as shown in Fig. 1-13 and appear at pin ⑬.

This functions only during rising edge of the output of pin ⑬ and will be in 1/9 mode when the RF switch pulse is "H" and 1/7 mode when "L", and remains in the 1/8 mode at other times.

If the input of pin ⑪ is divided 1/8 and is divided further to 1/44, the total division will be 1/352. As the divisions required are 1/351 and 1/353, these can be obtained if the 44th unit of the 1/44th division is divided 1/7 and 1/9.

Using these divisions, this IC generates 1/2 $f_H$ pulses from pin ⑥ for pilot bursts, cleaning pulses (pin ⑨), PAL and JOG.

After the VCO oscillations of Ch A = 351 $f_H$ (5.484 MHz) and Ch B = 353 $f_H$ (5.515 MHz) are counted down to 1/8, they are frequency converted using the 4.43 MHz VCO of IC004 (CX20008) entering pin ① and, after passing through the CF002, they are frequency-converted again using the original signal to form the low-converted chroma signals.

Ch A = 685 kHz

Ch B = 689 kHz

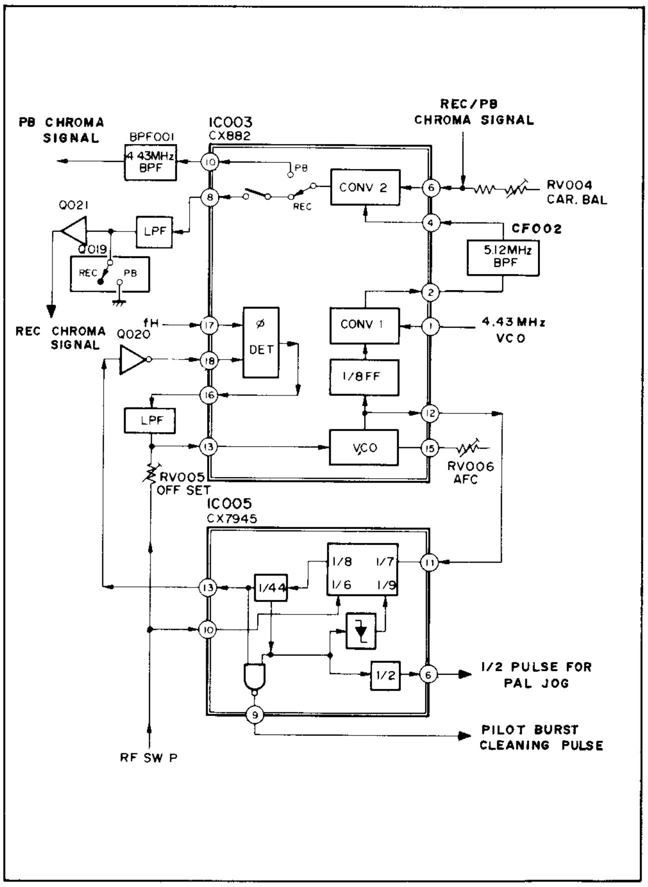

PB CHROMA SIGNAL
BPF001
4.43MHz BPF
IC003
CX882
PB
REC
CONV 2
RV004
CAR. BAL
Q021
LPF
Q019
REC
PB
CF002
5.12MHz BPF
REC/PB CHROMA SIGNAL
fH
REC CHROMA SIGNAL
Q020
φ
DET
CONV 1
4.43MHz VCO
1/8FF
LPF
VCO
RV005
OFF SET
RV006
AFC
IC005
CX7945
1/8
1/7
1/6
1/9
1/44
1/2
1/2 PULSE FOR PAL JOG
PILOT BURST CLEANING PULSE
RF SW P
10
8
6
4
2
1
17
18
16
13
12
15
11
13
10
6
9

*Fig. 1-12.*

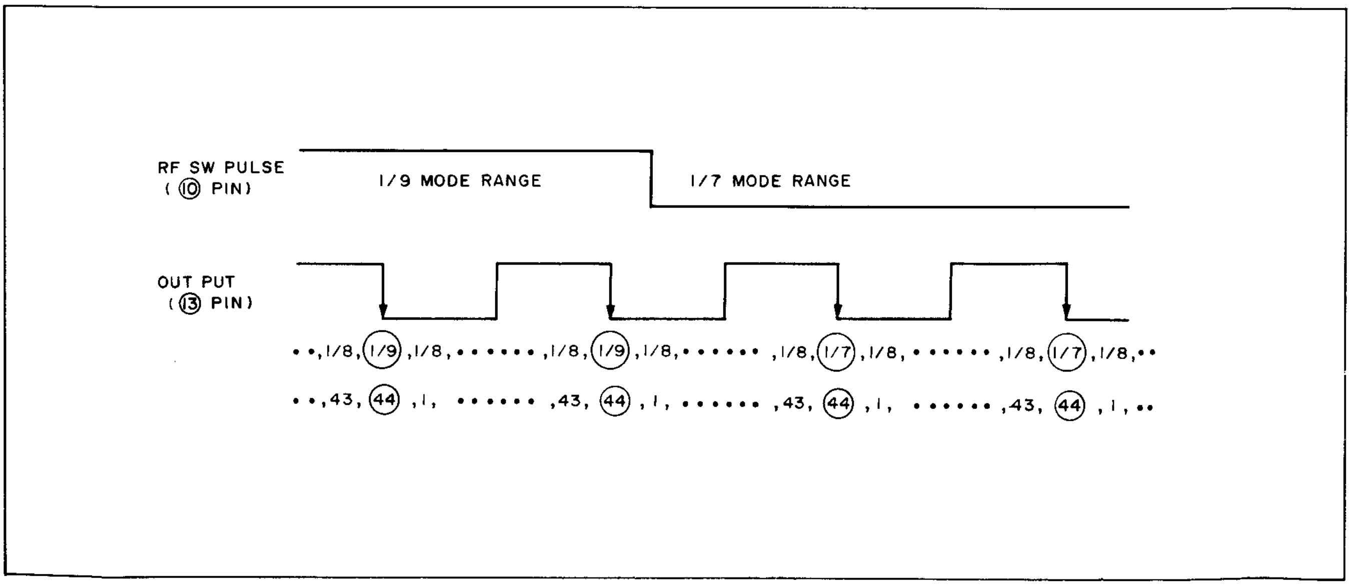

RF SW PULSE (⑩ PIN)
1/9 MODE RANGE
1/7 MODE RANGE
OUT PUT (⑬ PIN)
• •,1/8,(1/9),1/8,• • • • • • ,1/8,(1/9),1/8,• • • • • • ,1/8,(1/7),1/8,• • • • • • ,1/8,(1/7),1/8,• •
• •,43,(44),1, • • • • • • ,43,(44),1, • • • • • • ,43,(44),1, • • • • • • ,43,(44),1,• •

*Fig. 1-13.*

### 1-11. Chrominance Signal PB System

The signals entering from the head enter YC-25 board after passing through RY-1 board and enter pin ⑥ of IC001 after passing through the LPF. This signal passes through the REC/PB switch and, after being amplified to the prescribed level in the ACC amplifier, is output from pin ⑭. It then enters pin ⑥ of IC003 via IC002 and is returned to 4.43 MHz by means of Frequency Converter 2 and appears at pin ⑩. It then enters the comb filter after passing through the BPF.
The signals from the comb filter again enter IC001 from pin ㉗ where phase correction is carried out (Irregular color sync is detected by the BURST-ID DET and phase correction carried out by driving the FF and inverting the chroma amp.) and are output from pin ㉔. The signals then enter the JOG circuit.
The signals entering the JOG circuit normally enter pin ④ of IC014 after passing from Q024 to Q025, from pin ③ of IC009 (CX894) to pin ① of IC009 (CX894) and are output after being subjected to Y/C mix. In the normal mode, the PILOT BURST signal is only cleaned through the JOG circuit (IC009).

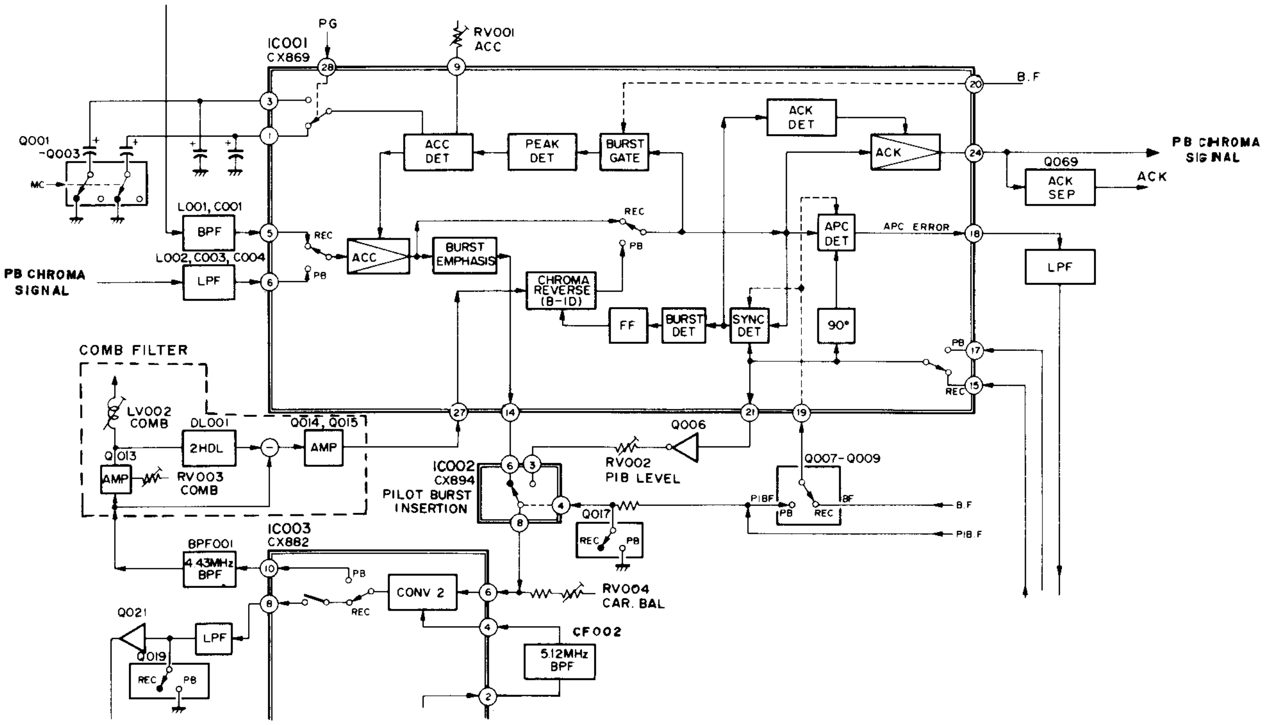

PG
IC001
CX869
RV001
ACC
B.F
ACK DET
ACC DET
PEAK DET
BURST GATE
ACK
PB CHROMA SIGNAL
Q069
ACK SEP
ACK
Q001 -Q003
MC
L001, C001
BPF
REC
PB
ACC
BURST EMPHASIS
APC DET
APC ERROR
L002, C003, C004
LPF
PB CHROMA SIGNAL
CHROMA REVERSE (B-ID)
FF
BURST DET
SYNC DET
90°
LPF
COMB FILTER
LV002 COMB
DL001
Q014, Q015
2HDL
AMP
Q006
Q013
AMP
RV003 COMB
IC002
CX894
PILOT BURST INSERTION
RV002
PIB LEVEL
Q007-Q009
PIBF
BF
PB
REC
B.F
PIB.F
Q017
IC003
CX882
BPF001
4.43MHz BPF
CONV 2
RV004
CAR. BAL
Q021
Q019
LPF
CF002
5.12MHz BPF

Fig. 1-14.

However, during variable-speed PB, the signal is processed as follows:
The tape format for $\beta$-PAL system is as shown in Fig. 1-15. The sequence of the chroma signal (Appears as alternate F and F*) therefore becomes inverted in the variable-speed PB mode causing normal color and inverted color (complementary colors) to appear alternately between the noise bars. To compensate for this, the inverted portion is detected and improvements in picture quality carried out by changing over to a 1H delay signal or replacing the EXCHANGE burst created from the reference 4.43 MHz signal with the normal burst.
After carrying out phase adjustments of the reference 4.43 MHz signal entering Q039 through C095 with RV008, the phase is delayed 0° or 180° with the 1/2 fH pulse of pin ⑥ of IC005. This signal is applied to pin ⑦ of IC010 (TA7320P) and phase comparison carried out with the playbacked chroma burst being applied to pin ⑥. This comparison output is then applied to IC011 and, after waveform shaping, is applied to control pins ② and ④ of IC009 where the through (at pin ③ of IC009) and 1H delay (of pin ① of IC009) signals are changed over. Of the REF 4.43 MHz signals entering Q039, the signal delayed 90° in Q044 and Q045 is resistance mixed (R139, R140) with the previous 0° or 180° changeover signal and become EXCHANGE bursts and enter pin ⑥ of IC009. The phase adjustment of this EXCHANGE bursts signal is carried out by RV008.

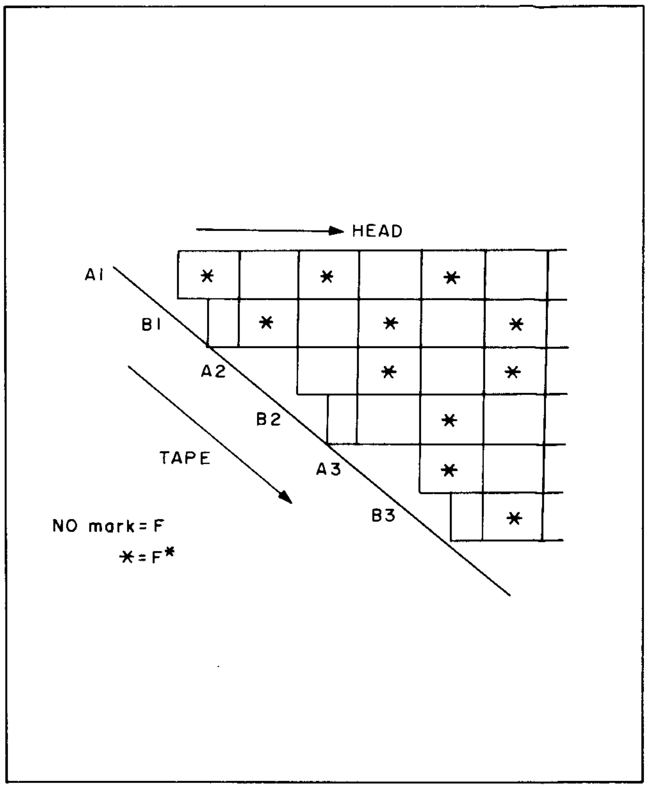

HEAD
A1
B1
A2
B2
A3
B3
TAPE
*
NO mark = F
* = F*

Fig. 1-15.

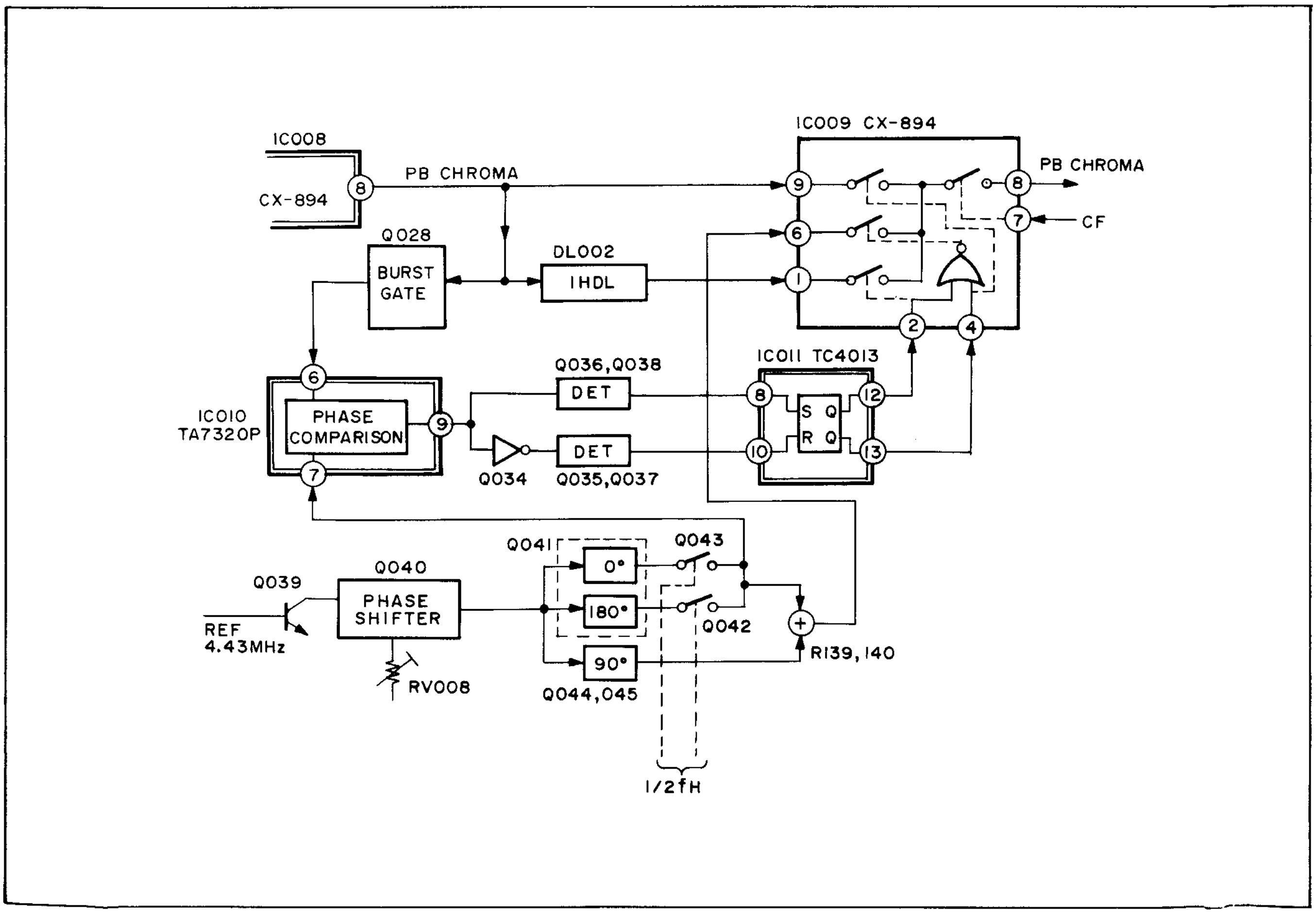

IC008
CX-894
8
PB CHROMA
Q028
BURST GATE
DL002
1HDL
IC009 CX-894
9
6
1
8
7
2
4
PB CHROMA
CF
IC010
TA7320P
6
PHASE COMPARISON
9
7
Q036,Q038
DET
DET
Q034
Q035,Q037
IC011 TC4013
8
10
12
13
S Q
R Q
Q041
0°
180°
90°
Q043
Q042
Q039
Q040
PHASE SHIFTER
REF 4.43MHz
RV008
Q044,045
+
R139,140
1/2fH

Fig. 1-16. PAL JOG mode

IC012 (TC4069) is used for various types of waveform shaping.

Inverter of pins ①—② and ③—④ is for 1/2 fH use.
Inverter of pins ⑤—⑥ and ⑧—⑨ is for CF use.
Inverter of pins ⑩—⑪ and ⑫—⑬ is for PILOT burst flags.

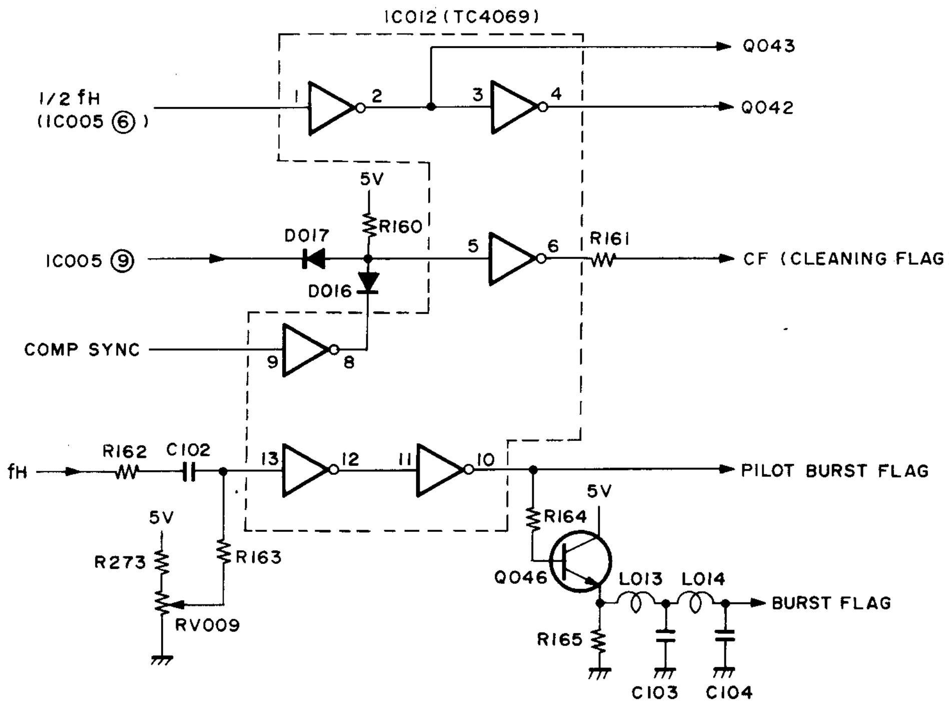

IC012 (TC4069)
Q043
1/2 fH
(IC005 ⑥)
1
2
3
4
Q042
5V
R160
D017
IC005 ⑨
5
6
R161
CF (CLEANING FLAG)
D016
COMP SYNC
9
8
R162
C102
fH
13
12
11
10
PILOT BURST FLAG
5V
R164
5V
R273
R163
Q046
L013
L014
BURST FLAG
RV009
R165
C103
C104

*Fig. 1-17.*

## 2. SYSTEM CONTROL

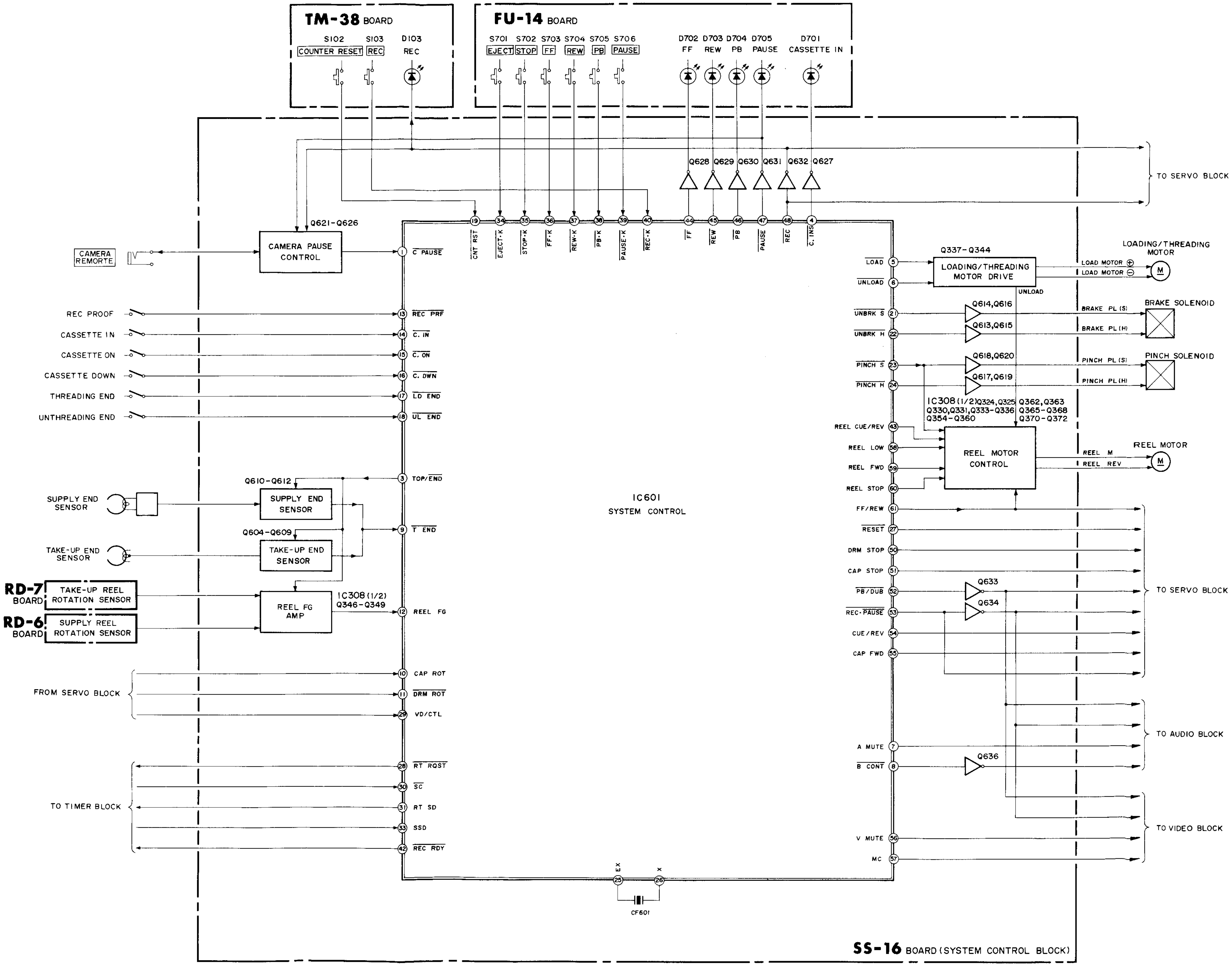
### 2-1. General

The system control circuit is configured of the SS-16 board and the FU-14 board.

The SS-16 board is provided with 1 microcomputer and a tape end sensor circuit, camera remote circuit, loading motor drive circuit and a plunger drive circuit and the monitoring signals of the various types of key and SW information are read and control signals sent to each block based on these signals. Data transfer is also carried out between the timer/remote control microcomputer of the timer block with receiving and transmission of remote control signals and counter display codes.

The FU-14 board is composed of the FUNCTION keys and display lamps and is controlled by the microcomputer in SS-16 board.

A block diagram of the System Control circuit is shown in Fig. 2-1.



TM-38 BOARD
S102 COUNTER RESET
S103 REC
D103 REC
FU-14 BOARD
S701 EJECT
S702 STOP
S703 FF
S704 REW
S705 PB
S706 PAUSE
D702 FF
D703 REW
D704 PB
D705 PAUSE
D701 CASSETTE IN
Q628 Q629 Q630 Q631 Q632 Q627
TO SERVO BLOCK
Q621-Q626
CAMERA PAUSE CONTROL
CAMERA REMORTE
C PAUSE
CNT RST
EJECT-K
STOP-K
FF-K
REW-K
PB-K
PAUSE-K
REC-K
FF
REW
PB
PAUSE
REC
C. INS
REC PROOF
CASSETTE IN
CASSETTE ON
CASSETTE DOWN
THREADING END
UNTHREADING END
REC PRF
C. IN
C. ON
C. DWN
LD END
UL END
Q610-Q612
SUPPLY END SENSOR
SUPPLY END SENSOR
TOP/END
Q604-Q609
TAKE-UP END SENSOR
TAKE-UP END SENSOR
T END
RD-7 BOARD
TAKE-UP REEL ROTATION SENSOR
RD-6 BOARD
SUPPLY REEL ROTATION SENSOR
REEL FG AMP
IC308 (1/2) Q346-Q349
REEL FG
IC601 SYSTEM CONTROL
FROM SERVO BLOCK
CAP ROT
DRM ROT
VD/CTL
TO TIMER BLOCK
RT RQST
SC
RT SD
SSD
REC RDY
EX
X
CF601
Q337-Q344
LOADING/THREADING MOTOR DRIVE
LOADING/THREADING MOTOR
LOAD
UNLOAD
LOAD MOTOR ⊕
LOAD MOTOR ⊖
UNBRK S
UNBRK H
Q614,Q616
Q613,Q615
BRAKE PL (S)
BRAKE PL (H)
BRAKE SOLENOID
PINCH S
PINCH H
Q618,Q620
Q617,Q619
PINCH PL (S)
PINCH PL (H)
PINCH SOLENOID
IC308 (1/2) Q324,Q325 Q330,Q331,Q333-Q336 Q354-Q360
Q362,Q363 Q365-Q368 Q370-Q372
REEL CUE/REV
REEL LOW
REEL FWD
REEL STOP
REEL MOTOR CONTROL
REEL M
REEL REV
REEL MOTOR
FF/REW
RESET
DRM STOP
CAP STOP
PB/DUB
REC·PAUSE
CUE/REV
CAP FWD
Q633
Q634
TO SERVO BLOCK
A MUTE
B CONT
Q636
TO AUDIO BLOCK
V MUTE
MC
TO VIDEO BLOCK
SS-16 BOARD (SYSTEM CONTROL BLOCK)

Fig. 2-1. System control block diagram

## 2-2. General Description of IC601

IC601 which is the uncleus of the System Control section uses the 4-bit microcomputer MB88421.

Its principal features are as follows.

1) It is provided with a 4,096 word × 8 bit ROM and a 192 word × 4 bit static RAM.
2) It has 57 I/O ports, an 8 bit binary counter and a 4 bit serial buffer for serial transfers.
3) It is provided with a clock generator that operates with a 4 MHz clock. (Minimum instruction time 3 $\mu$sec)
4) It is provided with a low voltage detection reset circuit and a power-ON reset circuit.
5) Operates from a single +5V source and is a 64-pin shrink package by the N-MOS process.

A block diagram of the MB88421 is shown in Fig. 2-2 and the signal allocation and function of each port of IC601 is shown in Table 2-1.

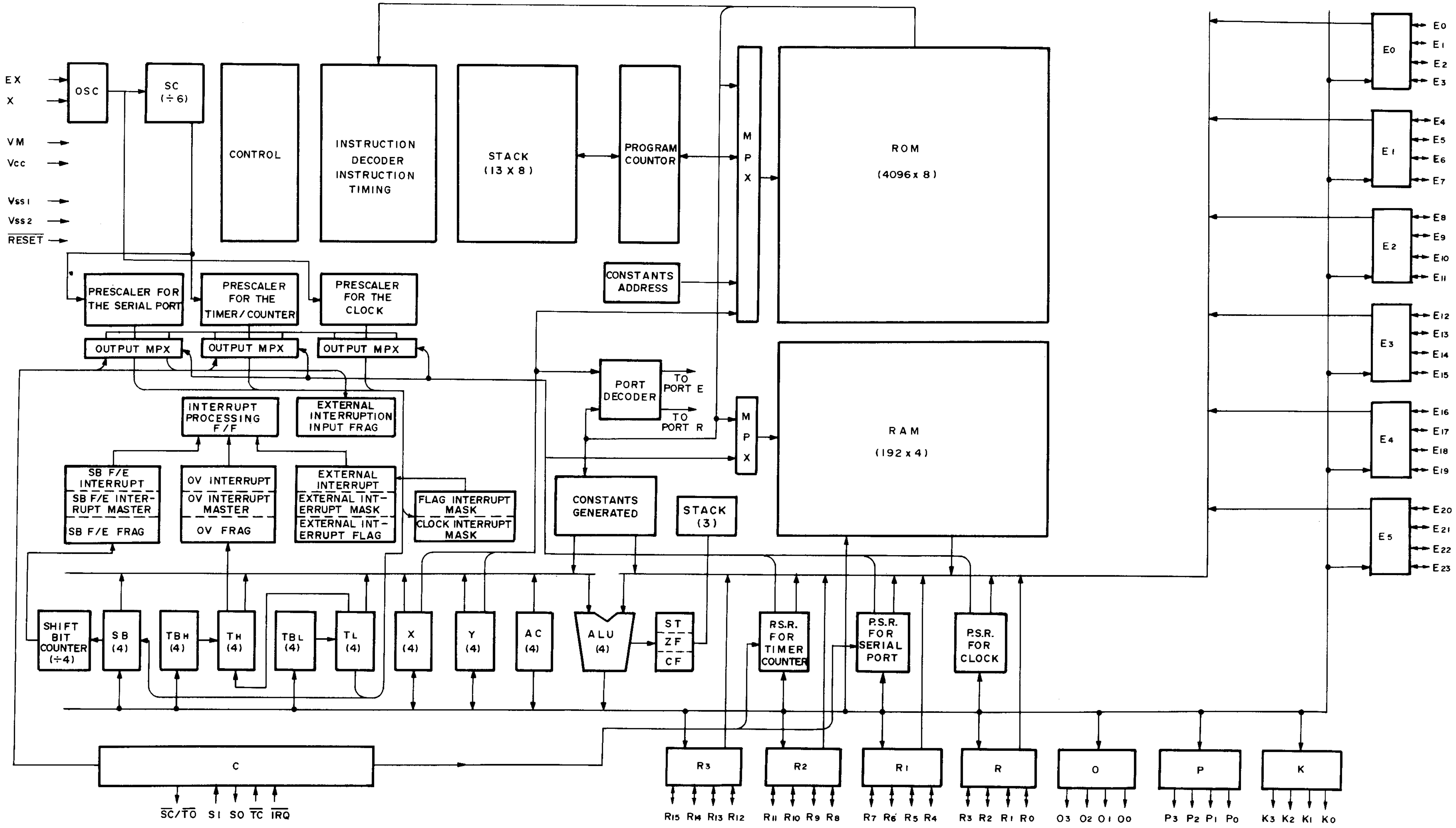

EX
X
VM
Vcc
Vss1
Vss2
RESET
OSC
SC (÷6)
CONTROL
INSTRUCTION DECODER INSTRUCTION TIMING
STACK (13 X 8)
PROGRAM COUNTOR
M P X
ROM (4096 x 8)
CONSTANTS ADDRESS
PRESCALER FOR THE SERIAL PORT
PRESCALER FOR THE TIMER/COUNTER
PRESCALER FOR THE CLOCK
OUTPUT MPX
OUTPUT MPX
OUTPUT MPX
PORT DECODER
TO PORT E
TO PORT R
RAM (192 x 4)
INTERRUPT PROCESSING F/F
EXTERNAL INTERRUPTION INPUT FRAG
SB F/E INTERRUPT
SB F/E INTER-RUPT MASTER
SB F/E FRAG
OV INTERRUPT
OV INTERRUPT MASTER
OV FRAG
EXTERNAL INTERRUPT
EXTERNAL INT-ERRUPT MASK
EXTERNAL INT-ERRUPT FLAG
FLAG INTERRUPT MASK
CLOCK INTERRUPT MASK
CONSTANTS GENERATED
STACK (3)
SHIFT BIT COUNTER (÷4)
SB (4)
TBH (4)
TH (4)
TBL (4)
TL (4)
X (4)
Y (4)
AC (4)
ALU (4)
ST
ZF
CF
P.S.R. FOR TIMER COUNTER
P.S.R. FOR SERIAL PORT
P.S.R. FOR CLOCK
C
SC/TO SI SO TC IRQ
R3
R2
R1
R
O
P
K
R15 R14 R13 R12
R11 R10 R9 R8
R7 R6 R5 R4
R3 R2 R1 R0
O3 O2 O1 O0
P3 P2 P1 P0
K3 K2 K1 K0
E0
E1
E2
E3
E4
E5
E0 E1 E2 E3
E4 E5 E6 E7
E8 E9 E10 E11
E12 E13 E14 E15
E16 E17 E18 E19
E20 E21 E22 E23

*Fig. 2-2. Block diagram*

*Table 2-1.*

| Pin No. | Signal | I/O | Function and operation | Connected to |
|---|---|---|---|---|
| 1 | $\overline{\text{C·PAUSE}}$<br>(CAMERA·PAUSE) | I | Pause signal from the camera remote circuit. Pauses at "L". | To the camera REMOTE jack via the camera remote circuit. |
| 2 | Inhibit | O | ———————— | ———————— |
| 3 | TOP/$\overline{\text{END}}$ | O | End sensor and reel FG switching circuit. H: Selects side T, L: Selects side S. | END SENSOR<br>Reel Block |
| 4 | $\overline{\text{C·INS}}$<br>(Cassette Inside) | O | Cassette inside LED drive. Lights when at "L". | To cassette inside LED through the drive transistor (FU-14 board). |
| 5 | $\overline{\text{LOAD}}$ | O | Threading motor control. Turns normally when "L". | To threading motor drive circuit. |
| 6 | $\overline{\text{UNLOAD}}$ | O | Threading motor control. Turns in reverse when "L". | To threading motor drive circuit. |
| 7 | A Mute<br>(Audio Muting) | O | Audio mute signal. Mute when at "H". | Audio Block |
| 8 | $\overline{\text{BCONT}}$<br>(Bias Control) | O | Causes bias oscillator to function during audio recording. Oscilates when at "L". | Audio Block |
| 9 | $\overline{\text{TEND}}$ | I | Tape TOP/END input signal. Judges whether top or end at "L" and is switched over with TOP/$\overline{\text{END}}$. | To Tape-end sensor |
| 10 | CAP ROT<br>(Capstan Rotation) | I | Detects capstan rotation. At "H" when rotating. | To servo block |
| 11 | $\overline{\text{DRMROT}}$ | I | Detects drum rotation. At "L" when rotating. | To servo block |
| 12 | REEL FG | I | FG signal from the supply/take-up reel. Changes over with the TOP/$\overline{\text{END}}$ signal. 60 Waves with 1 reel revolution. | To the reel block |
| 13 | $\overline{\text{REC PRF}}$<br>(REC·Proof SW) | I | Safety tab breakage detector SW input information. Safety tab broken when "H". | To the mechanism block |
| 14 | $\overline{\text{C·IN}}$<br>(Cassette In SW) | I | Cassette-In SW input information. Makes when "L". | To the mechanism block |
| 15 | $\overline{\text{C·ON}}$<br>(Cassette On SW) | I | Cassette-On SW input information. Makes when "L". | To the mechanism block |
| 16 | $\overline{\text{C·DWN}}$<br>(Cassette Down SW) | I | Cassette-Down SW input information. Makes when "L". | To the mechanism block |
| 17 | $\overline{\text{LDEND}}$<br>(Threading End SW) | I | Threading-End SW input information. Makes when "L". | To the mechanism block |
| 18 | $\overline{\text{ULEND}}$<br>(Unthreading End SW) | I | Unthreading-End SW input information. Makes when "L". | To the mechanism block |
| 19 | $\overline{\text{CNTRST}}$<br>(Counter Reset key) | I | Counter Reset Key input information. Makes when "L". | To the counter reset key via the timer block. |
| 20 | $\overline{\text{G}}$ | I | Skip Scan Permit/Prohibit factory SW. FR Search prohibit when "L". | ———————— |
| 21 | $\overline{\text{UNBRKS}}$<br>(Unbrake Solenoid Start) | O | Pulse output for setting unbrake solenoid. Sets when "L". Pulse width 200 msec. | To unbrake solenoid via the drive circuit. |
| 22 | $\overline{\text{UNBRKH}}$<br>(Unbrake Solenoid Hold) | O | Hold signal output for the unbrake Hold signal output for the unbrake solenoid. Holds when "L". | To unbrake solenoid via the drive circuit. |
| 23 | $\overline{\text{PNCHS}}$<br>(Pinch Solenoid Start) | O | Pulse output for setting the pinch solenoid. Sets when "L". Pulse width 200 msec. | To the pinch solenoid via the drive circuit. |
| 24 | $\overline{\text{PNCHH}}$<br>(Pinch Solenoid Hold) | O | Hold signal output for the pinch solenoid. Sets when "L". Holds when "L". | To the pinch solenoid via the drive circuit. |
| 25 | (EX) | I | Clock generator terminals | Connected to the ceramic oscillator. |
| 26 | (X) | O | Clock generator terminals | Connected to the ceramic oscillator. |
| 27 | $\overline{\text{194RESET}}$ | O | Reset output for the servo IC (CX194). Resets when "L". Outputs 60 to 70 msec pulse when power is on. | To servo block |
| 28 | $\overline{\text{RTRQST}}$<br>(Remocon/Timer Request) | I | Data transfer demand signal from the timer microcomputer. | To the timer block |
| 29 | VD/CTL | I | Pulse input for counter. No counts when 50 CTL's. | To the servo block |
| 30 | $\overline{\text{SC}}$<br>(Shift Clock) | O | Clock output used for data transmission | Timer block |
| 31 | RTSD<br>(Remocon/Timer Serial Data) | I | Serial data input supplied from a timer microcomputer. | Timer block |
| 32 | Vss1 | | GND (E) | |
| 33 | SSD | O | Serial data output supplied to a timer microcomputer. | Timer block |
| 34 | $\overline{\text{EJECT·K}}$<br>(Eject key) | I | Input when the EJECT key is pressed. | EJECT key (on the FU-14 board.) |
| 35 | $\overline{\text{STP·K}}$<br>(stop key) | I | Input when the STOP key is pressed. | STOP key (on the FU-14 board.) |
| 36 | $\overline{\text{FF·K}}$<br>(FF key) | I | Input when the FF key is pressed. | FF key (on the FU-14 board. |
| 37 | $\overline{\text{REW·K}}$<br>(REW key) | I | Input when the REW key is pressed. | REW key (on the FU-14 board) |
| 38 | $\overline{\text{PB·K}}$<br>(PB·key) | I | Input when the PB key is pressed. | PB key (on the FU-14 board) |
| 39 | $\overline{\text{PSE·K}}$<br>(Pause key) | I | Input when the PAUSE key is pressed. | PAUSE key (on the FU-14 board) |
| 40 | $\overline{\text{REC·K}}$<br>(REC·key) | I | Input when the REC key is pressed. | REC key (on the timer block) |
| 41 | $\overline{\text{DUB·K}}$<br>(Dubbing key) | I | Dubbing key input (Not used) | ———————— |
| 42 | $\overline{\text{RECRDY}}$<br>(REC Ready) | O | Advises timer that timer REC not possible. Not possible when "L". | To the timer block |
| 43 | R·C/R<br>(REEL CUE/REV) | O | Reel motor drive voltage control signal. "H" when CUE/REV. | To the reel block |
| 44 | $\overline{\text{FF}}$<br>(FF LED) | O | For lighting the FF LED. Lights when "L". | To FF LED via the Q628 driver. (FU-14 Board) |
| 45 | $\overline{\text{REW}}$<br>(REW LED) | O | For lighting the REW LED. Lights when "L". | To the REW LED via the Q629 driver. (FU-14 board) |
| 46 | $\overline{\text{PB}}$<br>(PB LED) | O | For lighting the PB LED. Lights when "L". | To the PB LED via the Q630 driver. (FU-14 board) |

| | | | | |
|---|---|---|---|---|
| 47 | $\overline{\text{PAUSE}}$<br>(Pause LED) | O | For lighting the PAUSE LED.<br>Lights when "L". | To the Pause LED via the Q631 driver. (FU-14 board) |
| 48 | $\overline{\text{REC}}$<br>(REC LED) | O | For lighting the REC LED.<br>Lights when "L". | To the REC LED via the Q632 driver. (TM-38 board) |
| 49 | $\overline{\text{DUB}}$<br>(DUB LED) | O | For lighting the DUB LED. Not used. | ———— |
| 50 | DRMSTP<br>(DRUM Motor Stop) | O | Drum motor stop instructions.<br>Stops when "H". | To the servo block |
| 51 | CAP STP<br>(Capstan Motor Stop) | O | Capstan motor stop instructions.<br>Stops when "H". | Servo Block |
| 52 | $\overline{\text{PB + DUB}}$ | O | Playback and EE switching signal.<br>Playback when "L". | Servo<br>Video Block<br>Auido |
| 53 | $\overline{\text{REC}\cdot\overline{\text{P}}}$ | O | Recording control signal.<br>Records when "L". | Servo<br>Video Block<br>Audio |
| 54 | CUE/REV | O | CUE/REV operation instruction.<br>CUE/REV mode when "H". | Servo Block |
| 55 | CAP FWD<br>(Capstan Forward) | O | Instructs direction of rotation of the capstan. Forward when "H". | Servo Block |
| 56 | V Mute<br>(Video Muting) | O | Mute signal for video.<br>Muted when "H". | Video Block |
| 57 | JOG<br>(MC) | O | Indicates now in variable speed mode.<br>"H" When in variable speed mode. | Video Block |
| 58 | REEL LOW | O | Reel motor voltage control signal. | Reel Block |
| 59 | REEL FWD<br>(REEL Forward) | O | Instructs direction of rotation of the reel motor. Forward rotation when "H". | Reel Block |
| 60 | REEL STP<br>(Reel stop) | O | Reel motor stop instructions.<br>Stops when "H". | Reel Block |
| 61 | FF/REW | O | Reel motor voltage control signal. | Reel Block |
| 62 | $V_{SS2}$ | O | GND (E) | |
| 63 | $V_M$ | | SW5V | |
| 64 | $V_{CC}$ | | SW5V | |

## 2-3. Cassette Loading and Tape Threading Operation

When threading, refer to the reel motor control circuit in relation to reel motor operation. Control of cassette loading and tape threading is carried out by microcomputer IC601. IC601 detects conditions of the loading mechanism and threading mechanism by means of its 5 input terminals (See Table 2-2).

| Detection items | Input terminal | Switch |
|---|---|---|
| CASSETTE IN | IC601 ⑭ | S301(CS-3 board) |
| CASSETTE ON | IC601 ⑮ | S302(CS-4 board) |
| CASSETTE DOWN | IC601 ⑯ | S902 |
| THREADING END | IC601 ⑰ | S903 |
| UNTHREADING END | IC601 ⑱ | S904 |

*Table 2-2.*

IC601 carries out loading and threading operations by controlling the threading motor, pinch solenoid, brake solenoid and reel motor.

Refer to 3-6. Reel Motor Control Circuit in relation to the reel motor operation when carrying out front loading.

### 1. Front loading and threading operations

Refer to the Loading/Threading Timing Chart (Fig. 2-4)

(1) When the cassette is inserted, cassette-in switch (S301) will be pushed to ON position by the cam in the mechanical block. As a result, "L" signals will be input from the cassette-in switch input pin 14 ($\overline{\mathrm{C\ IN}}$) of microcomputer IC601 through R639 and IC601 will judge that the cassette is inserted.

(2) In addition, Cassette-On switch (S302) will be pushed to ON (connected) by the cam in the mechanical block when the cassette is inserted. As a result, "L" signals will be input from the Cassette-On switch input pin 15 ($\overline{\mathrm{C.\ ON}}$) of IC601 through R680.

(3) When an "L" signal is input from pin ⑮ of IC601, IC601 will judge that the cassette is inserted. A start pulse ‾|_|‾ will be output from the pinch solenoid start output pin ㉓ and the pinch roller solenoid (PM901) will operate. At the same time, "L" signals will be output from the pinch solenoid hold output pin ㉔ and the unit will be in operating condition. The stopper arm holds the loading gear due to the operation of the pinch roller solenoid.

(4) An "L" signal is then output from the loading output pin ⑤ of IC601 and the loading motor commences to turn (See Motor Drive Circuit). The motor revolutions are transmitted to internal gears that drive the FL cassette compartment through the loading belt and carries out loading of the cassette.

(5) As cassette loading advances, the cassette compartment lowers and the cassette-down switch (S902) is pushed to ON position by the cassette case. Cassette-down switch input pin ⑯ ($\overline{\mathrm{C\text{-}DOWN}}$) of IC601 then becomes "L" through R641. With this, the microcomputer will judge that loading is over and will advance to the next threading operation.

(6) First, "L" signals are output from pin (60) (REEL STP) of IC601 to cause the reel motor to operate. At the same time, the reel is caused to reverse by a combination of output signals from pin (59) (REEL FWD), pin (58) (REEL LOW) and pin (61) (FF/REW) of IC601 to remove tape slack. After removing the slack, pin ⑤ ($\overline{\mathrm{LOAD}}$) of IC601 is set to "H" and the loading motor stopped temporarily.

(7) The pinch roller hold output of IC601 will then set pin ㉔ to "H" and will stop the operation of the pinch solenoid. Stopping of the pinch solenoid operation causes the stopper arm to hold the internal gears by spring action. As the internal gear is secured, the revolution of the loading motor will be transmitted to the loading gear. The slider gear and threading ring are then driven by the loading gear. Threading will then be carried out here by changing the output of pin ⑤ to "L" again.

(8) Upon completion of threading, the threading-end switch (S903) will be set to ON by the threading ring. The threading-end switch input pin ⑰ ($\overline{\mathrm{THEND}}$) of IC601 then becomes "L" through R642. IC601 then judges that threading is complete.

(9) When threading is complete, IC601 sets pin ⑤ ($\overline{\mathrm{LOAD}}$) to "H" and stops the motor. It also outputs brake solenoid start pulse ‾|_|‾ from pin ㉑ ($\overline{\mathrm{UBRK\ S}}$) and causes the brake solenoid to function. At the same time, Hold Output pin ㉒ ($\overline{\mathrm{UBRK\ H}}$) is set to "L" to maintain operation. This causes the mechanical brake to release and pin (60) (REEL STP) to be set to "L" at the same time thus causing the tape to advance slightly as the reel will be set to fast feed mode (same as the Skip Scan CUE mode). Then, by setting pin ㉒ ($\overline{\mathrm{UBRK\ H}}$) to "H" and pin (60) (REEL STP) to "H", the reel brake will be applied and the reel stopped.

(10) The operation in Step (9) is then repeated once again. Lastly, pin ㉒ ($\overline{\mathrm{UBRK\ H}}$) is set to "H" and the fast feed mode of the reel ended. The cassette will then be in condition to move to the next mode STOP (Ready).

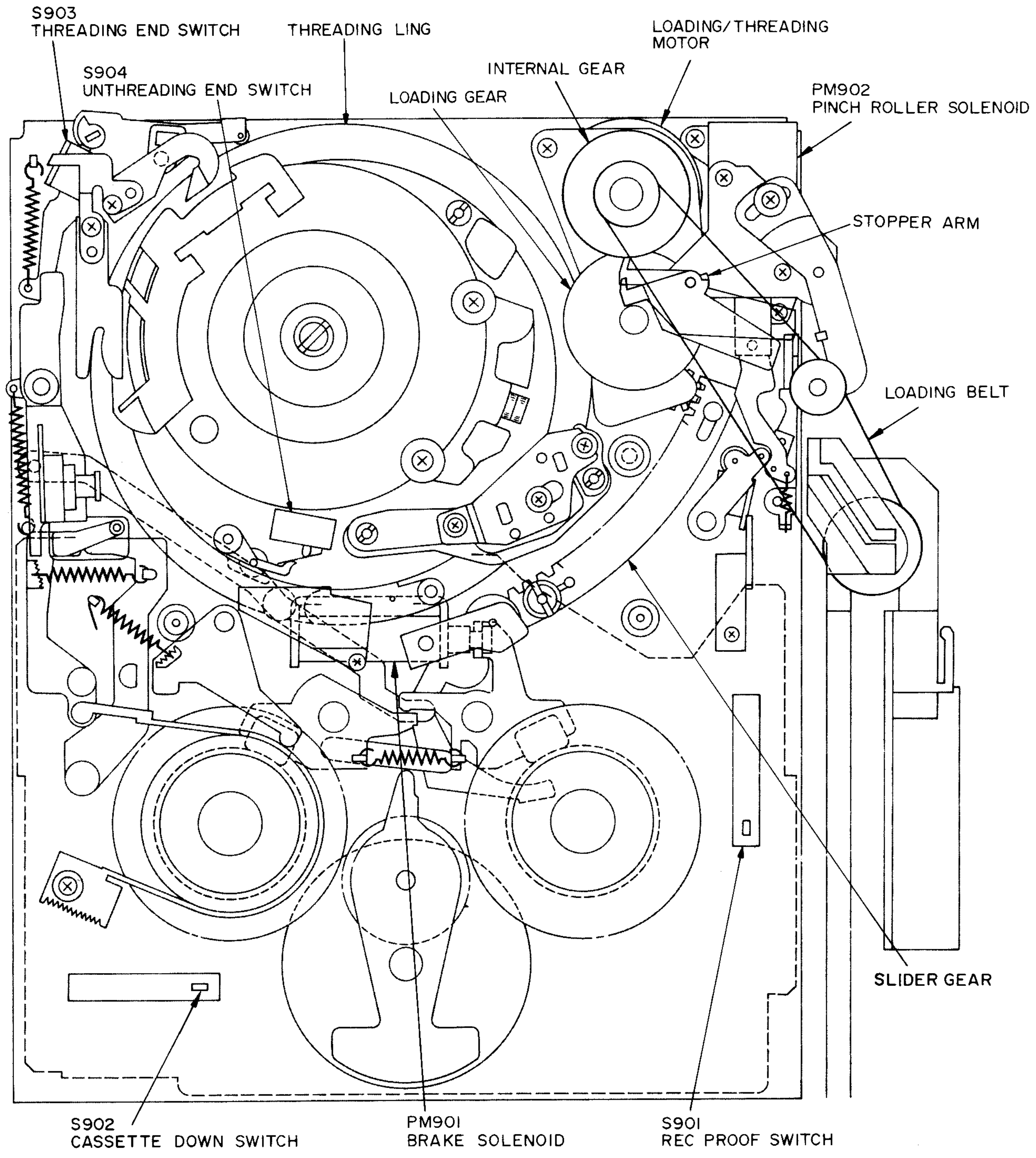

S903
THREADING END SWITCH
THREADING LING
LOADING/THREADING MOTOR
S904
UNTHREADING END SWITCH
INTERNAL GEAR
LOADING GEAR
PM902
PINCH ROLLER SOLENOID
STOPPER ARM
LOADING BELT
SLIDER GEAR
S902
CASSETTE DOWN SWITCH
PM901
BRAKE SOLENOID
S901
REC PROOF SWITCH

Fig. 2-3(1). Mechanical block

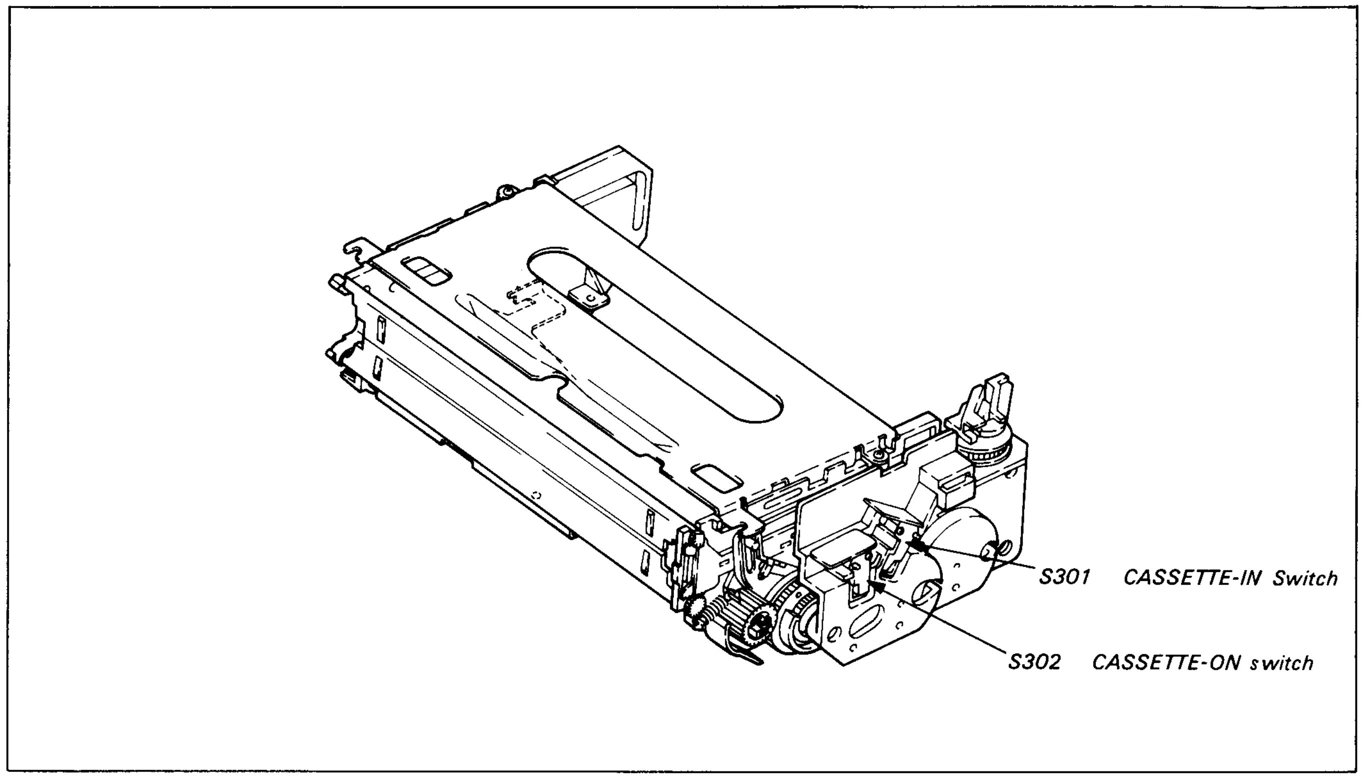

S301 CASSETTE-IN Switch
S302 CASSETTE-ON switch

Fig. 2-3(2). FL CASSETTE COMPARTMENT

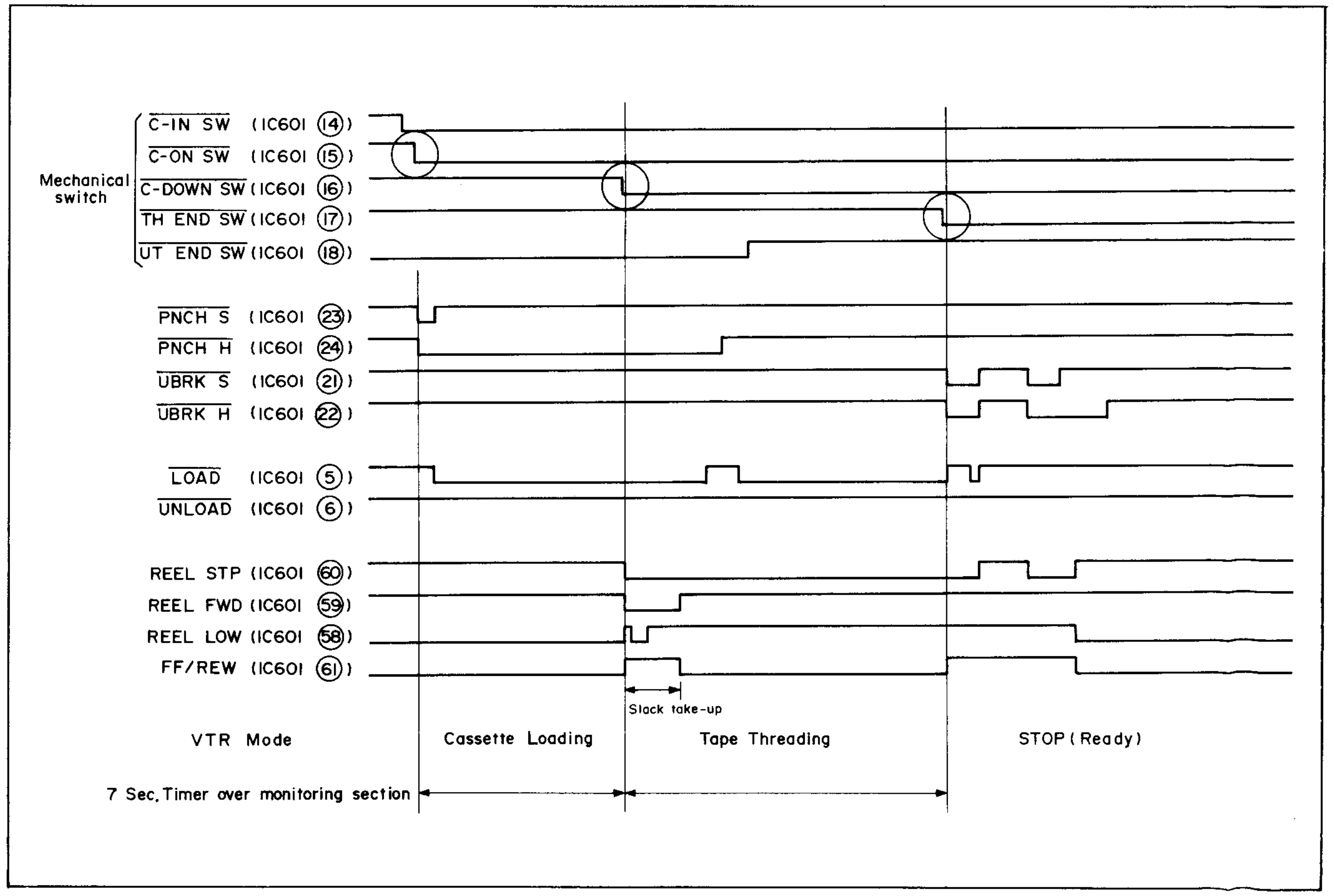


Fig. 2-4. Loading/threading time chart

### 2. Unthreading and unloading operation

Refer to the Unthreading/Unloading Timing Chart (Fig. 2-5).

(1) If the eject key is depressed, pin ㉞ ($\overline{\text{EJCT-K}}$) of IC601 will become "L" through R672 and IC601 will commence cassette eject operations.

(2) ⊔⊓ Pulse will be output from pin ⑥ ($\overline{\text{UNLOAD}}$) of IC601 causing the loading motor to reverse and move the loading ring which releases the brake of reel base S by means of the L coupling plate.

(3) Then, the loading motor will be stopped, pin (60) (REEL STP) set to "L", pin (59) (REEL FWD) set to "L", pin (58) (REEL LOW) set to "H", pin (61) (FF/REW) set to "H", the reel motor set to Skip Scan REV mode and the slack in the tape taken up.

(4) In addition, "L" is output from pin ⑥ (UNLOAD) and, with pin (61) (FF/REW) set to "L", the loading motor is reversed and tape unthreading carried out while taking up the tape with the reel.

(5) The Unthreading-end SW (S904) is set to ON by means of the threading ring as the unthreading operation advances. This will cause "L" to be input to Unthreading-end SW Input pin ⑱ ($\overline{\text{UTEND}}$) of IC601 through R643 and IC601 will judge that unthreading is over.

(6) When the unthreading operation ends, IC601 sets pin ⑥ ($\overline{\text{UNLOAD}}$) to "H" and stops the loading motor. At the same time, it sets the reel motor to the REV mode of skip scan by setting pin (61) (FF/REW) to "H" and removes slack in the tape (to prevent wrapping around the drum).

(7) Pin (60) (REEL STP) of IC601 is then set to "H" and the reel motor stopped. At the same time "L" is output from pinch roller solenoid output pins ㉓ and ㉔ of IC601 and the solenoid will be in operating condition. The operation of the solenoid causes the stopper arm to hold the loading gear. As the loading gear is held, the revolution of the loading motor is transmitted to the internal gear which drives the cassette compartment through the loading belt. Pin ⑤ ($\overline{\text{UNLOADING}}$) of IC601 is then set to "L" to carry out cassette unloading.

(8) When the cassette compartment is raised, the cassette-down switch (S902) will be set to OFF.

(9) When the cassette compartment is raised and the cassette ejected, the cassette-on switch (S302) will be set to OFF (open) state by the cam of the mechanical block.

(10) When the cassette is ejected, the cassette-in switch (S301) will be set to OFF (open) state by the cam of the mechanical block. As S301 will open, the cassette-in switch input pin ⑭ of IC601 ($\overline{\text{C-IN}}$) will become "H". With this, IC601 will judge that cassette unloading is over.

(11) When unloading is over, unloading output pin ⑥ ($\overline{\text{UNLOAD}}$) of IC601 becomes "H".

(12) In addition, to prevent the gears from binding, loading outputs appear at pin ⑤ and unloading outputs appear at pin ⑥.
Lastly, the pinch roller solenoid-hold pin ㉔ becomes "H" and the eject operation will be completed.

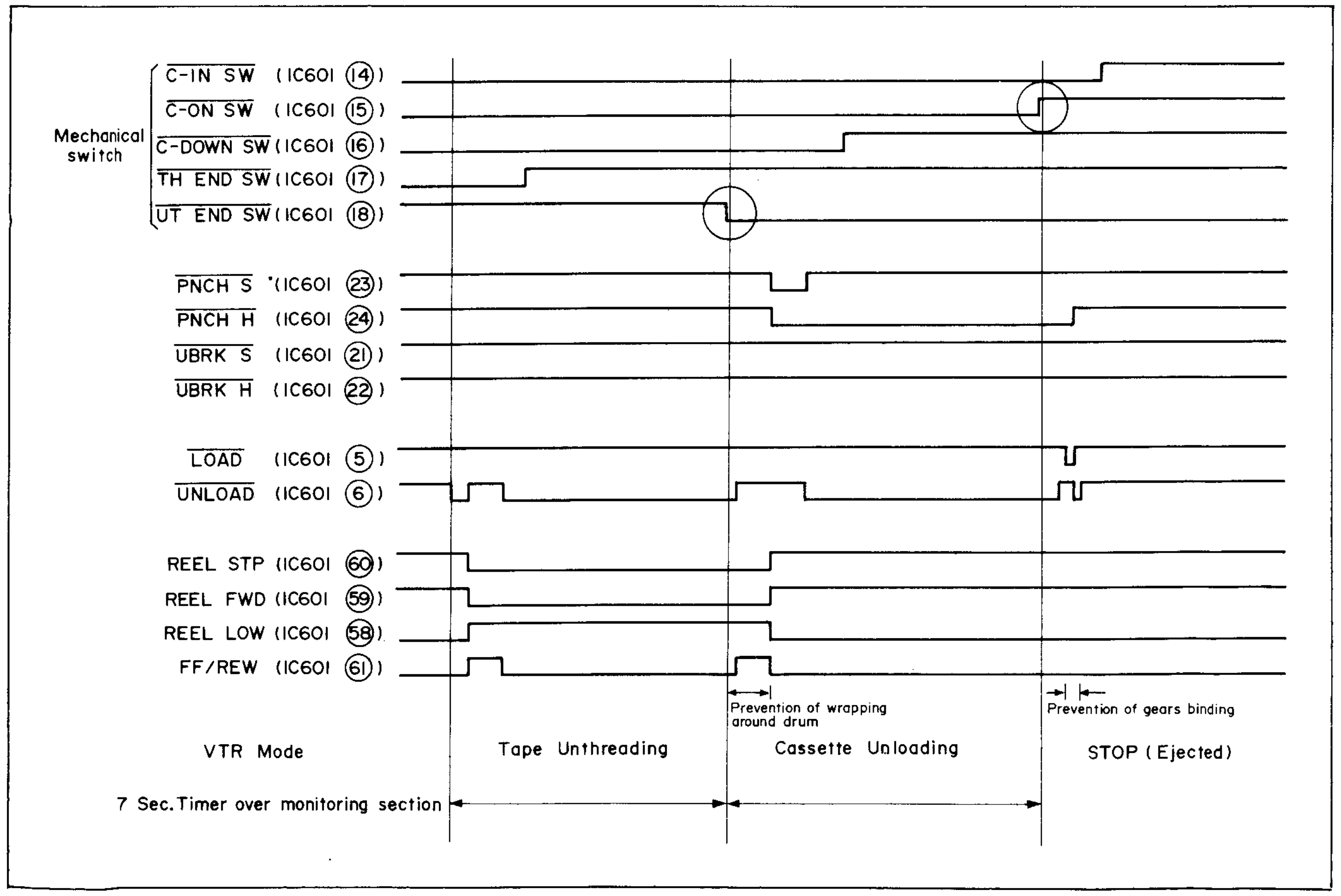
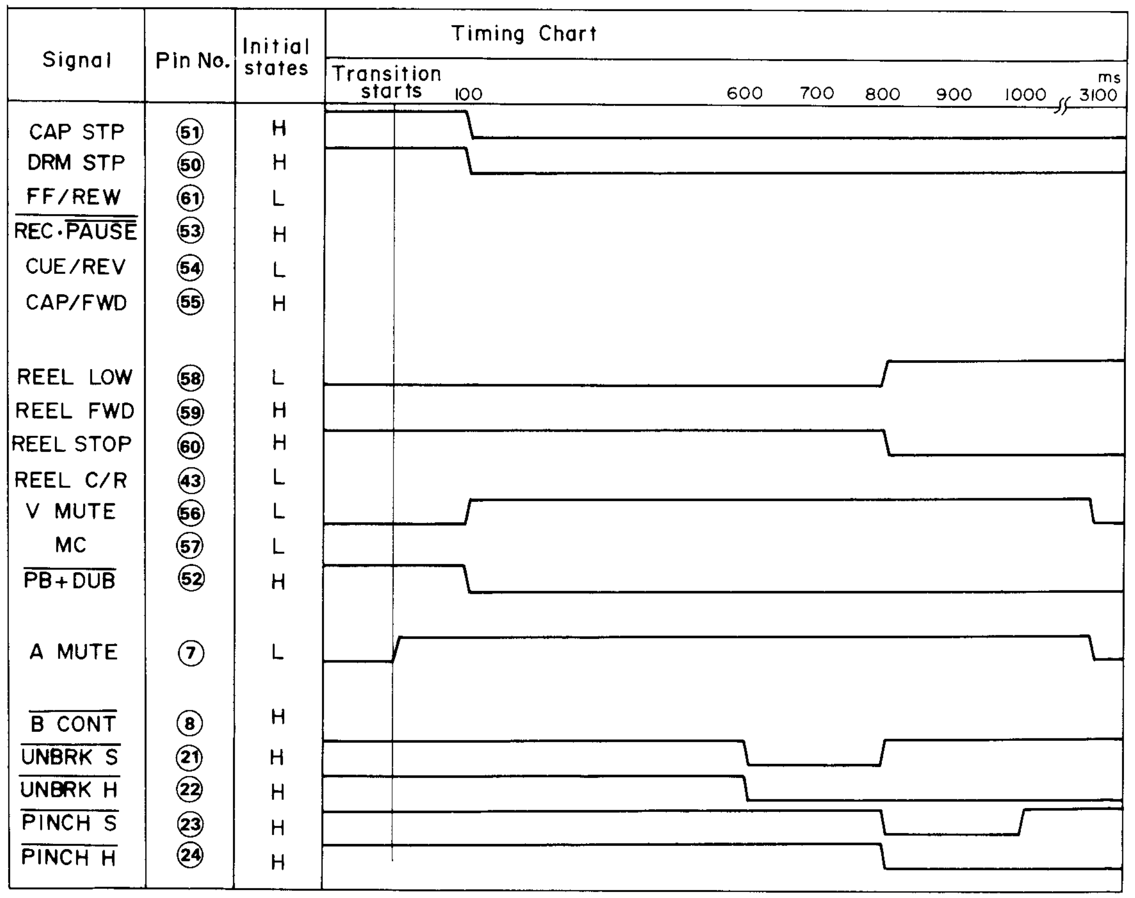

Mechanical switch
$\overline{\text{C-IN SW}}$ (IC601 ⑭)
$\overline{\text{C-ON SW}}$ (IC601 ⑮)
$\overline{\text{C-DOWN SW}}$ (IC601 ⑯)
$\overline{\text{TH END SW}}$ (IC601 ⑰)
$\overline{\text{UT END SW}}$ (IC601 ⑱)
$\overline{\text{PNCH S}}$ (IC601 ㉓)
$\overline{\text{PNCH H}}$ (IC601 ㉔)
$\overline{\text{UBRK S}}$ (IC601 ㉑)
$\overline{\text{UBRK H}}$ (IC601 ㉒)
$\overline{\text{LOAD}}$ (IC601 ⑤)
$\overline{\text{UNLOAD}}$ (IC601 ⑥)
REEL STP (IC601 (60))
REEL FWD (IC601 (59))
REEL LOW (IC601 (58))
FF/REW (IC601 (61))
Prevention of wrapping around drum
Prevention of gears binding
VTR Mode
Tape Unthreading
Cassette Unloading
STOP (Ejected)
7 Sec. Timer over monitoring section

*Fig. 2-5. Unthreading/unloading time chart*

### 2-4. Play-back Operation

When the PLAY button is depressed, pin ㊳ ($\overline{\text{PB K}}$ Input) of IC601 becomes "L" through R676. IC601 will then output AUDIO MUTE signals from pin ⑦ and set the output of pin (52) ($\overline{\text{PB + DUB}}$) to "L". This output will be supplied to each circuit through Q633 and will change over each circuit to the PLAY-BACK mode. VIDEO MUTE signals will also be output from pin (56). These AUDIO MUTE and VIDEO MUTE signals will be output for about 3 seconds until the servo operation stabilizes. At the same time, IC601 sets the CAPSTAN STOP output of pin (51) and the DRUM STOP output of pin ㊿ to "L" and starts the capstan motor and drum motor. It then releases the reel base brake by outputting UNBRAKE START pulses from pin ㉑ and UNBRAKE HOLD signals from pin ㉒. Following this, it outputs PINCH SOLENOID START pulses from pin ㉓ and PINCH SOLENOID HOLD signals from pin ㉔ to start the tape by pressing the pinch roller against the capstan. The reel motor is then started and the tape slack taken up by setting the REEL LOW output of pin (58) to "H" and the REEL STOP output of pin (60) to "L".

STOP → PB


Timing Chart
Transition starts
100
600
700
800
900
1000
3100
ms

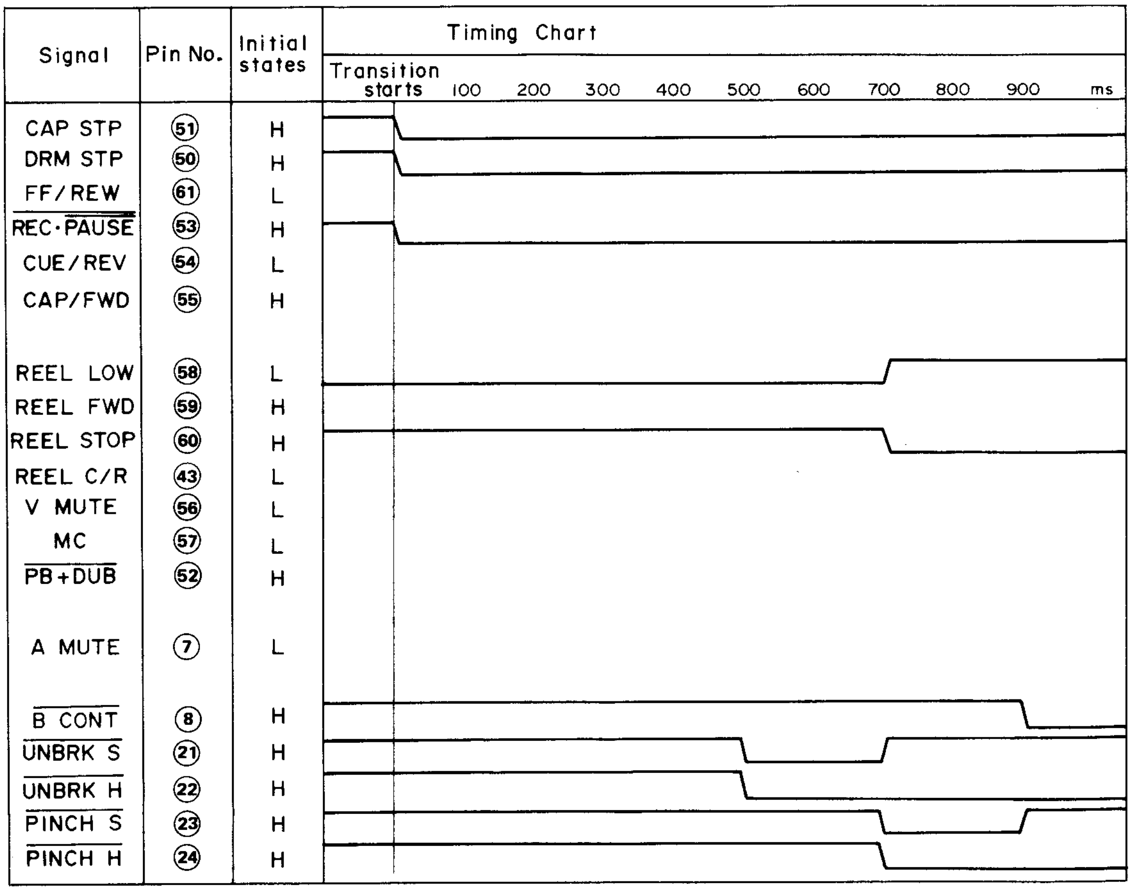
| Signal | Pin No. | Initial states |
|---|---|---|
| CAP STP | (51) | H |
| DRM STP | ㊿ | H |
| FF/REW | (61) | L |
| $\overline{\text{REC}\cdot\overline{\text{PAUSE}}}$ | (53) | H |
| CUE/REV | (54) | L |
| CAP/FWD | (55) | H |
| REEL LOW | (58) | L |
| REEL FWD | (59) | H |
| REEL STOP | (60) | H |
| REEL C/R | ㊸ | L |
| V MUTE | (56) | L |
| MC | (57) | L |
| $\overline{\text{PB+DUB}}$ | (52) | H |
| A MUTE | ⑦ | L |
| $\overline{\text{B CONT}}$ | ⑧ | H |
| $\overline{\text{UNBRK S}}$ | ㉑ | H |
| $\overline{\text{UNBRK H}}$ | ㉒ | H |
| $\overline{\text{PINCH S}}$ | ㉓ | H |
| $\overline{\text{PINCH H}}$ | ㉔ | H |

*Fig. 2-6.*

## 2-5. RECORD Operation

When the REC button is depressed, pin ㊵ ($\overline{\text{REC-K}}$) of IC601 becomes "L" through R611. This causes the output of pin (57) ($\overline{\text{REC-PAUSE}}$) of IC601 to become "L". This output is then supplied to each circuit through Q634 and changes the circuit to the RECORD mode. The control signals for the capstan motor, drum motor, reel motor, brake solenoid and pinch solenoid are also output in exactly the same manner as for the PLAYBACK operation. However, the VIDEO MUTE signal from pin (56) and the AUDIO MUTE signal from pin ⑦ will not be output at this time. At the end of the operations (pinch roller pressed against capstan), the output (B CONT) of pin ⑧ is set to "L" to operate the FULL ERASE head. Furthermore, if the cassette is not provided with an erroneous erasure prevention tab, pin ⑬ ($\overline{\text{REC PROOF}}$) of IC601 will become "L" and even if the RECORD button is depressed, the cassette will be ejected instead of the circuit going into the RECORD mode. The tape will also be ejected if the RECORD button is depressed at the end of the tape (Auto Eject).

STOP → REC



| Signal | Pin No. | Initial states |
|---|---|---|
| CAP STP | (51) | H |
| DRM STP | ㊿ | H |
| FF/REW | (61) | L |
| $\overline{\text{REC·PAUSE}}$ | (53) | H |
| CUE/REV | (54) | L |
| CAP/FWD | (55) | H |
| REEL LOW | (58) | L |
| REEL FWD | (59) | H |
| REEL STOP | (60) | H |
| REEL C/R | ㊸ | L |
| V MUTE | (56) | L |
| MC | (57) | L |
| $\overline{\text{PB+DUB}}$ | (52) | H |
| A MUTE | ⑦ | L |
| $\overline{\text{B CONT}}$ | ⑧ | H |
| $\overline{\text{UNBRK S}}$ | ㉑ | H |
| $\overline{\text{UNBRK H}}$ | ㉒ | H |
| $\overline{\text{PINCH S}}$ | ㉓ | H |
| $\overline{\text{PINCH H}}$ | ㉔ | H |

*Fig. 2-7.*

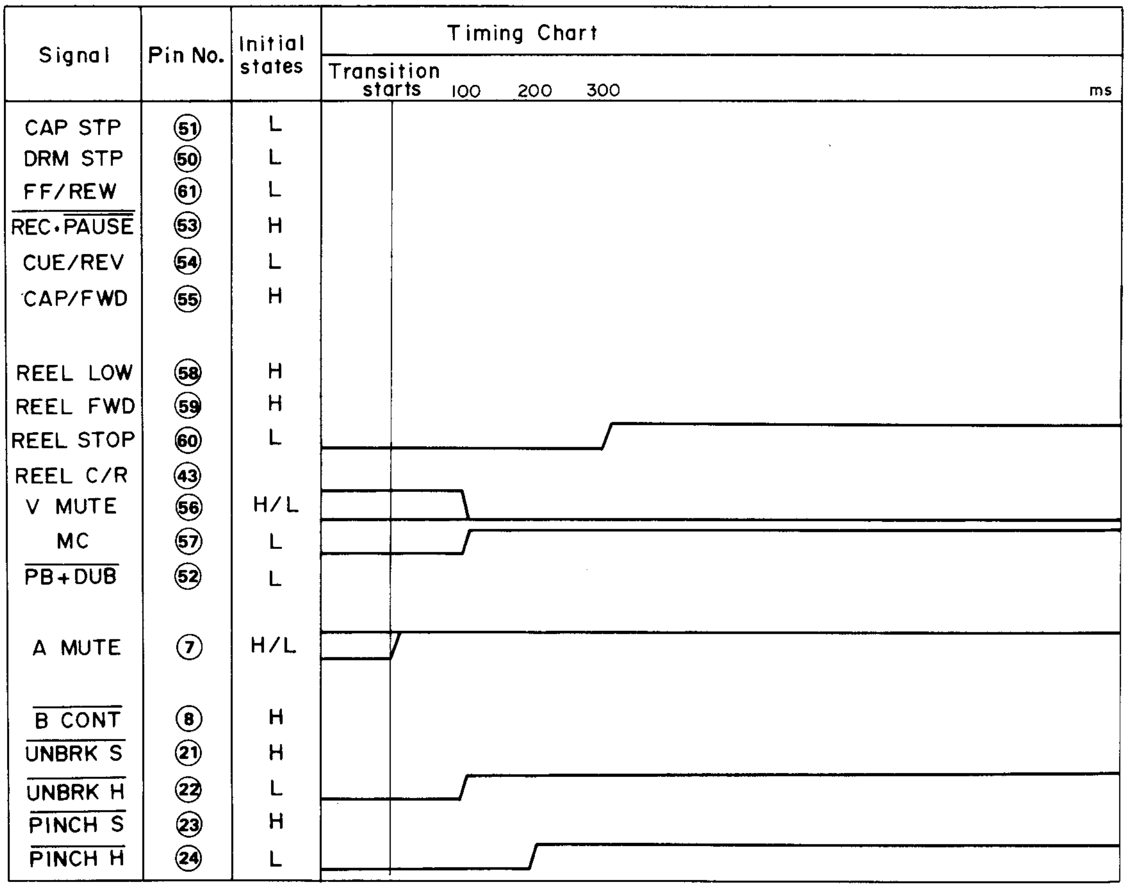
## 2-6. Pause Operation During Playback

If the PAUSE button is depressed during playback, pin ㊴ ($\overline{\text{PSE-K}}$) of IC601 will become "L" through R677 and the VTR will change from PB to PB PAUSE mode. AUDIO MUTE will be initially applied by setting the output (A MUTE) of pin ⑦ of IC601 to "H".

Next, the reel base brake is applied by setting the BRAKE SOLENOID HOLD signal of pin ㉒ of IC601 to "H". At the same time, the MC signal on pin (57) of IC601 for the video block is set to "H" to notify that the circuit is in the VARIABLE SPEED mode. The pinch roller is then released by setting the PINCH SOLENOID HOLD signal of pin ㉔ of IC601 to "H". Lastly, pin (60) (REEL STP) is set to "H" and the reel motor stopped. (The tape is tautened by the time difference from the time the mechanical brake is applied up to the time that the reel stops.)

Furthermore, the capstan motor and drum motor will continue to operate even during the pause state.

PB → PB PAUSE



| Signal | Pin No. | Initial states |
|---|---|---|
| CAP STP | (51) | L |
| DRM STP | ㊿ | L |
| FF/REW | (61) | L |
| REC•$\overline{\text{PAUSE}}$ | (53) | H |
| CUE/REV | (54) | L |
| CAP/FWD | (55) | H |
| REEL LOW | (58) | H |
| REEL FWD | (59) | H |
| REEL STOP | (60) | L |
| REEL C/R | ㊸ | |
| V MUTE | (56) | H/L |
| MC | (57) | L |
| $\overline{\text{PB+DUB}}$ | (52) | L |
| A MUTE | ⑦ | H/L |
| $\overline{\text{B CONT}}$ | ⑧ | H |
| $\overline{\text{UNBRK S}}$ | ㉑ | H |
| $\overline{\text{UNBRK H}}$ | ㉒ | L |
| $\overline{\text{PINCH S}}$ | ㉓ | H |
| $\overline{\text{PINCH H}}$ | ㉔ | L |

*Fig. 2-8.*

## 2-7. Pause Operation During Recording

If the PAUSE button is depressed during recording the outputs of both pin (53) (REC-P) and pin ⑧ (B CONT) will be set to "H" and each block will be notified that the recording operation will be interrupted. At the same time, pin ㉒ (UBRK H) and pin ㉔ (PNCH H) are set to "H" and the reel base brake will be applied and the pinch roller released. Pin (59) (REEL FWD) will be set to "L" at this time and the tape returned slightly by reversing the reel motor.

Lastly, pin (60) (REEL STP) is set to "H" and the reel motor stopped.

As in the case of pause during playback, the capstan and drum motors will continue to operate during pause operation when recording.

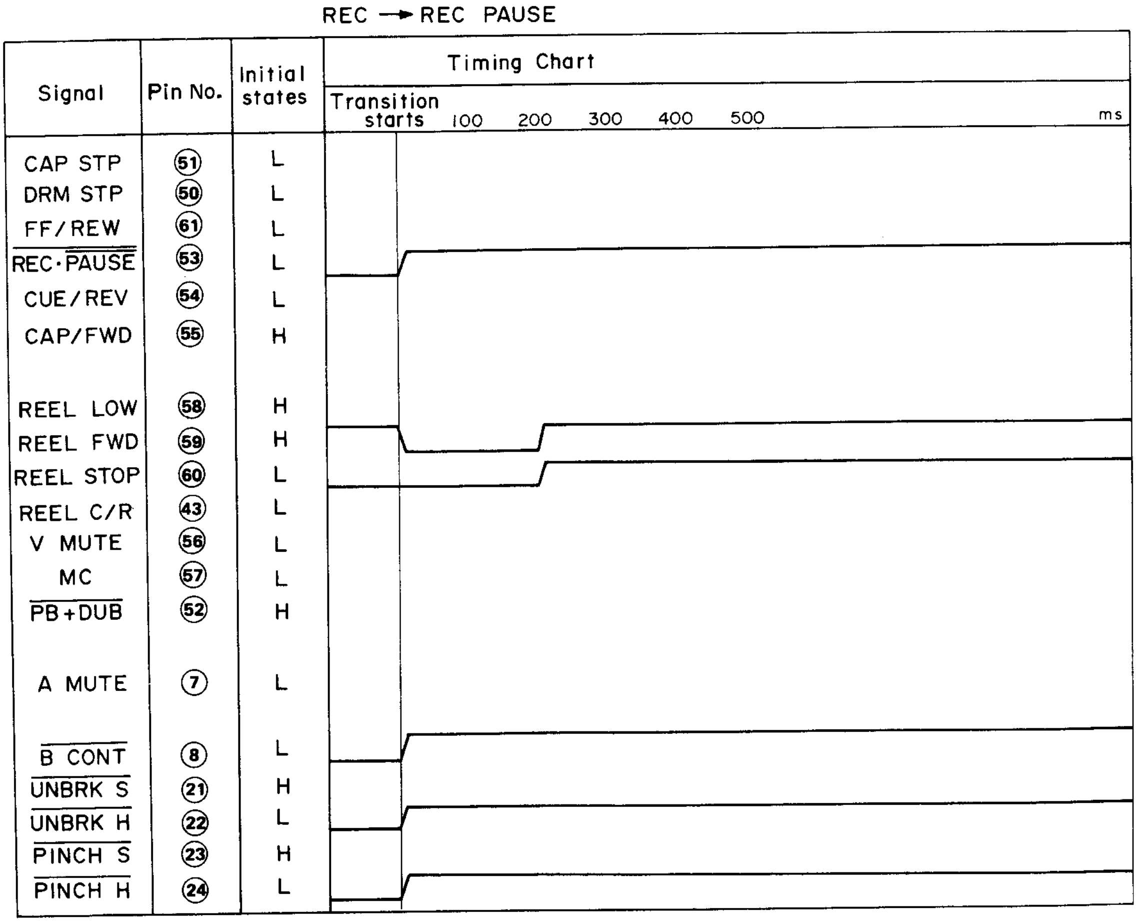


*Fig. 2-9.*

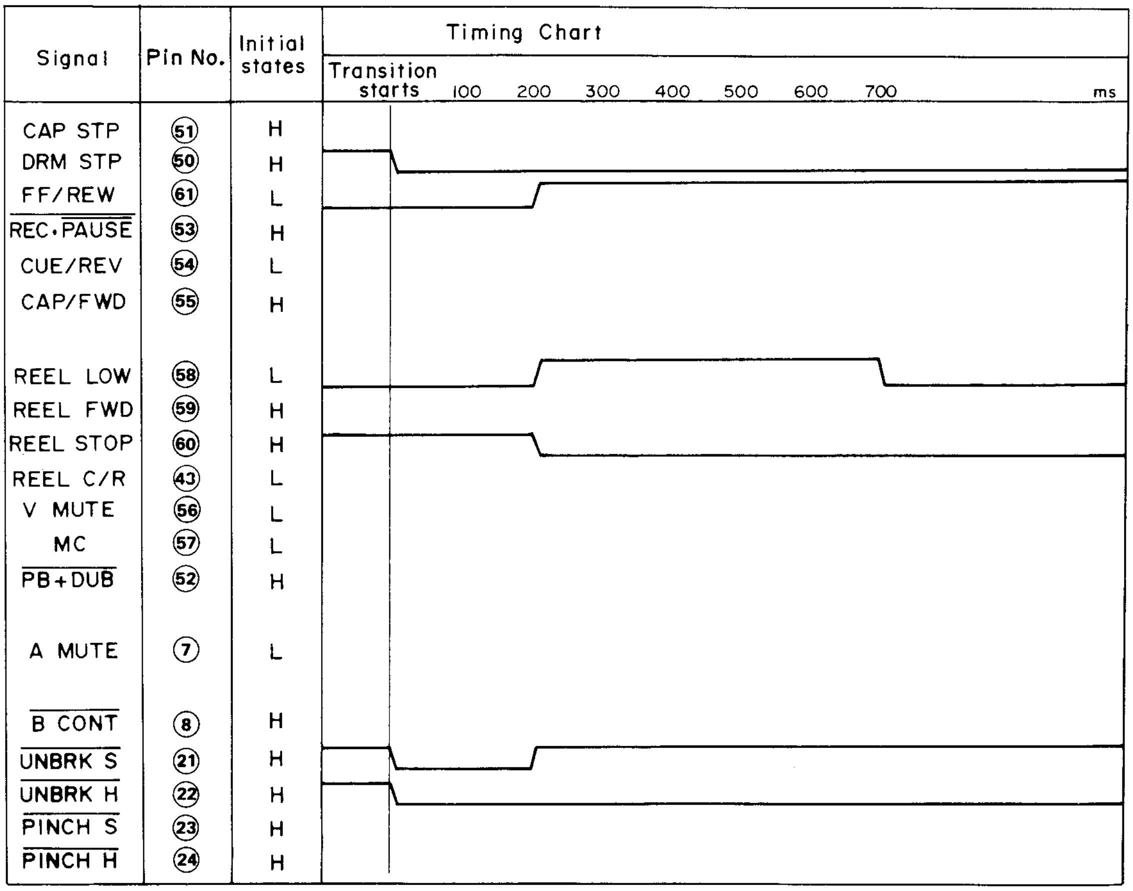
## 2-8. Fast Forward Operation

If the FF button is depressed, "L" will be input to pin ㊱ ($\overline{\text{FF-K}}$) of IC601 through R674 and will cause IC601 to go into the FF mode.

The unbrake solenoid will be operated and the reel base brake released by outputting UNBRAKE START pulses from pin ㉑ of IC601 and UNBRAKE HOLD signals from pin ㉒ . At the same time, the drum motor will be operated by setting pin ㊿ to "L". The reel motor will then be set to the SKIP SCAN mode by setting pin (60) (REEL STP) to "L", pin (61) (FF/REW) to "H" and pin (58) (REEL LOW) to "H" and tape feed started while removing tape slack.

Lastly, operations to the FF mode will be ended by setting pin (58) (REEL LOW) to "L" and the reel motor to the FF mode.

STOP → FF



| Signal | Pin No. | Initial states |
|---|---|---|
| CAP STP | (51) | H |
| DRM STP | ㊿ | H |
| FF/REW | (61) | L |
| $\overline{\text{REC}\cdot\text{PAUSE}}$ | (53) | H |
| CUE/REV | (54) | L |
| CAP/FWD | (55) | H |
| REEL LOW | (58) | L |
| REEL FWD | (59) | H |
| REEL STOP | (60) | H |
| REEL C/R | ㊸ | L |
| V MUTE | (56) | L |
| MC | (57) | L |
| $\overline{\text{PB+DUB}}$ | (52) | H |
| A MUTE | ⑦ | L |
| $\overline{\text{B CONT}}$ | ⑧ | H |
| $\overline{\text{UNBRK S}}$ | ㉑ | H |
| $\overline{\text{UNBRK H}}$ | ㉒ | H |
| $\overline{\text{PINCH S}}$ | ㉓ | H |
| $\overline{\text{PINCH H}}$ | ㉔ | H |

Fig. 2-10.

### 2-9. Rewind Operation

If the REW button is depressed, "L" will be input to pin ㊲ ($\overline{\text{REW-K}}$) of IC601 through R675 causing IC601 to go into the REW mode.

Although the operation is almost the same as in the case of FF, pin (59) (REEL FWD) of IC601 will be set to "L" and the reel motor reversed in the case of the REW operation. Pin ③ (TOP/$\overline{\text{END}}$) will be set to "H" and the tape-end sensor and reel FG amp circuit will be changed over to T.

STOP → REW

| Signal | Pin No. | Initial states |
|---|---|---|
| CAP STP | (51) | H |
| DRM STP | ㊿ | H |
| FF/REW | (61) | L |
| REC·$\overline{\text{PAUSE}}$ | (53) | H |
| CUE/REV | (54) | L |
| CAP/FWD | (55) | H |
| REEL LOW | (58) | L |
| REEL FWD | (59) | H |
| REEL STOP | (60) | H |
| REEL C/R | ㊸ | L |
| V MUTE | (56) | L |
| MC | (57) | L |
| $\overline{\text{PB+DUB}}$ | (52) | H |
| A MUTE | ⑦ | L |
| $\overline{\text{B CONT}}$ | ⑧ | H |
| $\overline{\text{UNBRK S}}$ | ㉑ | H |
| $\overline{\text{UNBRK H}}$ | ㉒ | H |
| $\overline{\text{PINCH S}}$ | ㉓ | H |
| $\overline{\text{PINCH H}}$ | ㉔ | H |

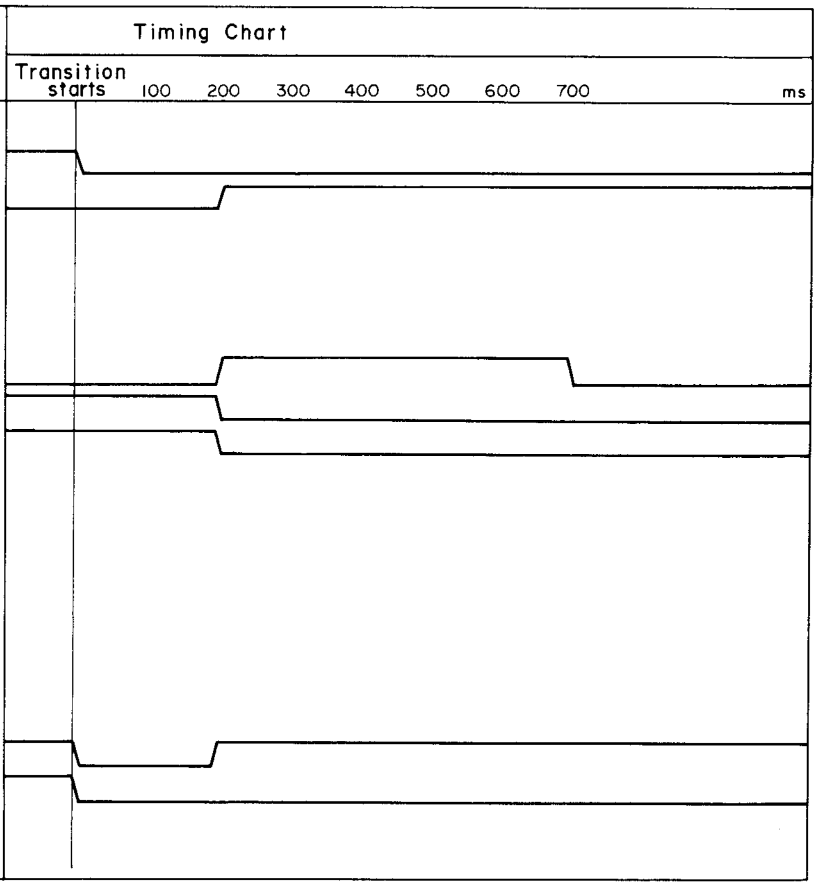


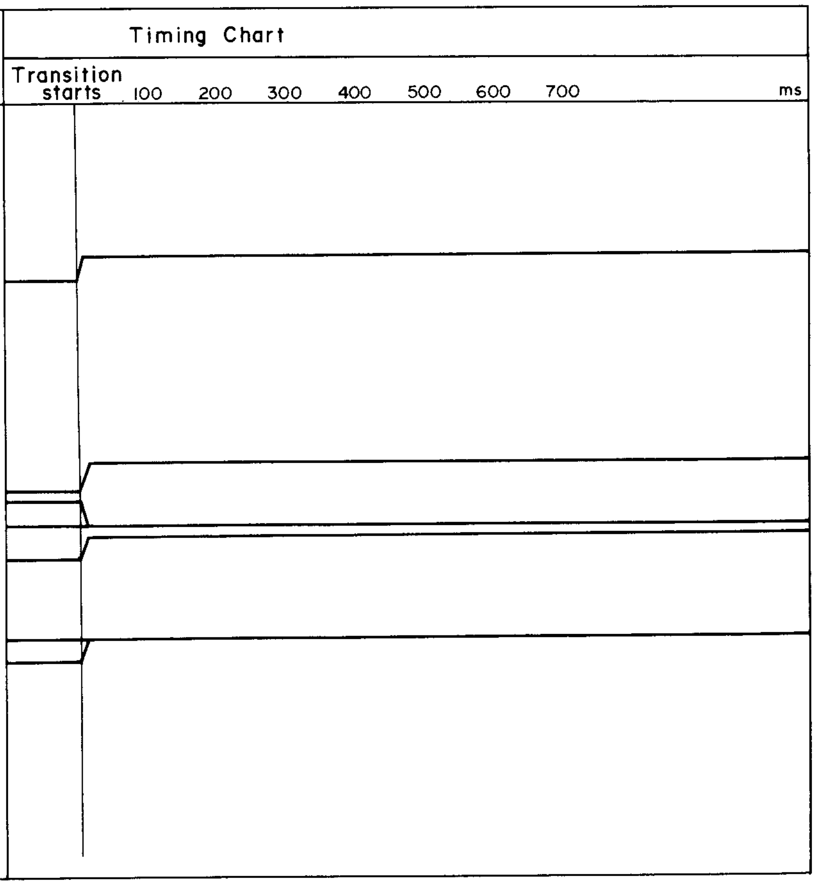
*Fig. 2-11.*

## 2-10. Picture Search Operation

### [Picture Search (CUE)]

If the FF button is depressed during playback, the circuit will be in PICTURE SEARCH (CUE) mode while the button is depressed. IC601 sets pin (54) (CUE/REV) and pin ㊸ (R-C/R) to "H" and sets the capstan servo system and the reel motor to CUE mode (+9 times speed). At the same time, it sets pin (57) (MC) to "H" and notifies the video block that it is in the variable speed mode. Pin ⑦ (A MUTE) is set to "H" and the audio playback signal muted.

PB → PICTURE SEARCH (CUE)



| Signal | Pin No. | Initial states |
|---|---|---|
| CAP STP | (51) | L |
| DRM STP | ㊿ | L |
| FF/REW | (61) | L |
| $\overline{\text{REC·PAUSE}}$ | (53) | H |
| CUE/REV | (54) | L |
| CAP/FWD | (55) | H |
| REEL LOW | (58) | H |
| REEL FWD | (59) | H |
| REEL STOP | (60) | L |
| REEL C/R | ㊸ | L |
| V MUTE | (56) | H/L |
| MC | (57) | L |
| $\overline{\text{PB+DUB}}$ | (52) | L |
| A MUTE | ⑦ | H/L |
| $\overline{\text{B CONT}}$ | ⑧ | H |
| $\overline{\text{UNBRK S}}$ | ㉑ | H |
| $\overline{\text{UNBRK H}}$ | ㉒ | L |
| $\overline{\text{PINCH S}}$ | ㉓ | H |
| $\overline{\text{PINCH H}}$ | ㉔ | L |

*Fig. 2-12.*

**[Picture Search (REVIEW)]**

If the REW button is depressed during playback, the circuit will be in PICTURE SEARCH (REVIEW) mode while the button is depressed.

Pin (51) (CAP STP) of IC601 is set to "H" and the capstan motor stopped momentarily. At the same time, pin (59) (REEL FWD) is set to "L" and the pendulum arm moved to the supply reel side by reversing the reel motor. The capstan motor is then reversed by setting pin (51) (CAP STP) to "L" and pin (55) (CAP FWD) to "L". Then pin (54) (CUE/REV) and pin ㊸ (R-C/R) are set to "H" and the capstan and reel motor set to REV mode (−9 times speed). At the same time, pin ③ (TOP/$\overline{\text{END}}$) is set to "H" and the tape-end sensor and reel FG amp changed over to T. PWM drive (8 pulses)/will then be carried out on pin (51) (CAP STP) for smooth startup of the capstan motor. Also, as in the case of Picture Search (CUE), pin (57) (MC) and pin ⑦ (A MUTE) will be set to "H" at the start of operations.

PB → PICTURE SEARCH (REVIEW)

| Signal | Pin No. | Initial states |
|---|---|---|
| CAP STP | (51) | L |
| DRM STP | ㊿ | L |
| FF/REW | (61) | L |
| REC·$\overline{\text{PAUSE}}$ | (53) | H |
| CUE/REV | (54) | L |
| CAP/FWD | (55) | H |
| REEL LOW | (58) | H |
| REEL FWD | (59) | H |
| REEL STOP | (60) | L |
| REEL C/R | ㊸ | L |
| V MUTE | (56) | H/L |
| MC | (57) | L |
| $\overline{\text{PB+DUB}}$ | (52) | L |
| A MUTE | ⑦ | H/L |
| $\overline{\text{B CONT}}$ | ⑧ | H |
| $\overline{\text{UNBRK S}}$ | ㉑ | H |
| $\overline{\text{UNBRK H}}$ | ㉒ | L |
| $\overline{\text{PINCH S}}$ | ㉓ | H |
| $\overline{\text{PINCH H}}$ | ㉔ | L |

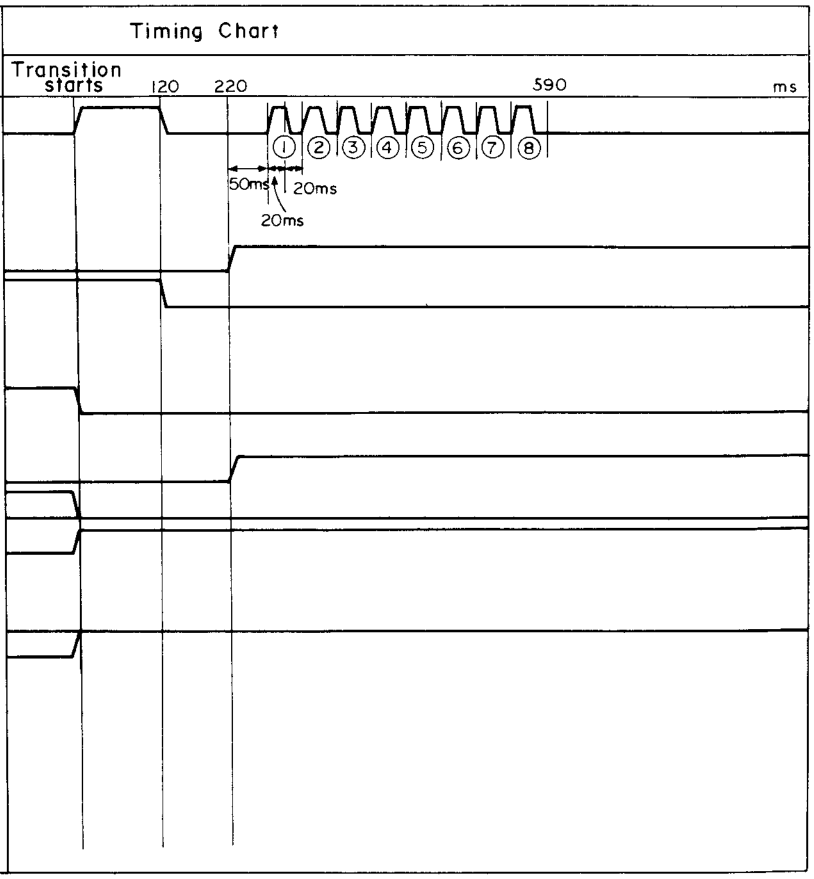


*Fig. 2-13.*

## 2-11. Skip Scan Operation

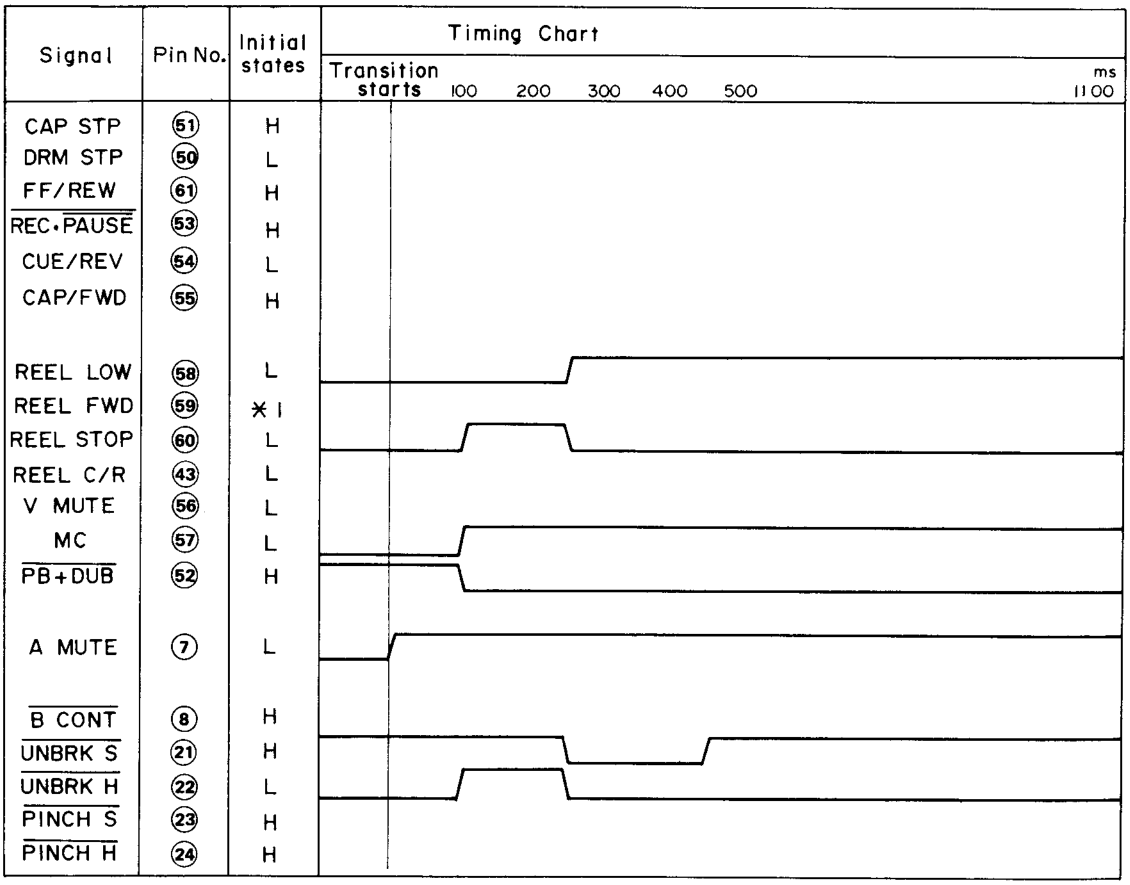
### [Skip Scan (CUE)]

If the FF button is depressed during FF, the circuit will be in SKIP SCAN (CUE) mode while the button is being depressed. Pin ⑦ (A MUTE) of IC601 is initially set to "H" to send MUTE signals to the audio block. The video, audio and servo blocks are then set to PLAYBACK mode by setting pin (52) ($\overline{\text{PB + DUB}}$) to "L". Pin (57) (MC) is then set to "H" to notify the video block that the circuit is in variable speed playback mode. At the same time, the reel motor is stopped by setting pin (60) (REEL STP) to "H". Pin ㉒ ($\overline{\text{UBRK H}}$) is then set to "H" and the reel speed reduced by applying brake to the reel base. The reel motor is then set to SKIP SCAN mode by setting pin (60) (REEL STP) to "L" and pin (58) (REEL LOW) to "H" and the mechanical brake also released.

### [Skip Scan (REVIEW)]

If the REW button is depressed during REW, the circuit will remain in the SKIP SCAN (REVIEW) mode while the button is depressed. The operation is the same as for Skip Scan (CUE) with the exception of the fact that the reel turns in reverse.

FF → SKIP SCAN (CUE)
REW → SKIP SCAN (REVIEW)



| Signal | Pin No. | Initial states |
|---|---|---|
| CAP STP | (51) | H |
| DRM STP | (50) | L |
| FF/REW | (61) | H |
| $\overline{\text{REC}\cdot\text{PAUSE}}$ | (53) | H |
| CUE/REV | (54) | L |
| CAP/FWD | (55) | H |
| REEL LOW | (58) | L |
| REEL FWD | (59) | ※1 |
| REEL STOP | (60) | L |
| REEL C/R | (43) | L |
| V MUTE | (56) | L |
| MC | (57) | L |
| $\overline{\text{PB+DUB}}$ | (52) | H |
| A MUTE | ⑦ | L |
| $\overline{\text{B CONT}}$ | ⑧ | H |
| $\overline{\text{UNBRK S}}$ | ㉑ | H |
| $\overline{\text{UNBRK H}}$ | ㉒ | L |
| $\overline{\text{PINCH S}}$ | ㉓ | H |
| $\overline{\text{PINCH H}}$ | ㉔ | H |

※1 H; FF → SKIP SCAN (CUE)
L; REW → SKIP SCAN (REV)

*Fig. 2-14.*

### 2-12. Threading Motor Drive Circuit

The threading motor drive circuit is shown in Fig. 2-15. When the $\overline{\text{LOAD}}$ signal of pin ⑤ of IC601 is applied to the base of Q342 through Q338 and Q339, Q342 and Q341 will turn ON and the threading motor will turn forward as 12V will be applied to the positive terminal of the threading motor and the negative terminal will be grounded. On the other hand, if the $\overline{\text{UNLOAD}}$ signal of pin ⑥ of IC601 enters the base of Q343 through Q337 and Q344, Q343 and Q340 will turn ON and the threading motor will turn in reverse as 12V will be applied to the negative terminal of the threading motor and the positive terminal will be grounded.

When both the $\overline{\text{LOAD}}$ and $\overline{\text{UNLOAD}}$ signals are "L", D317 will protect the circuit by giving priority to the threading operation.

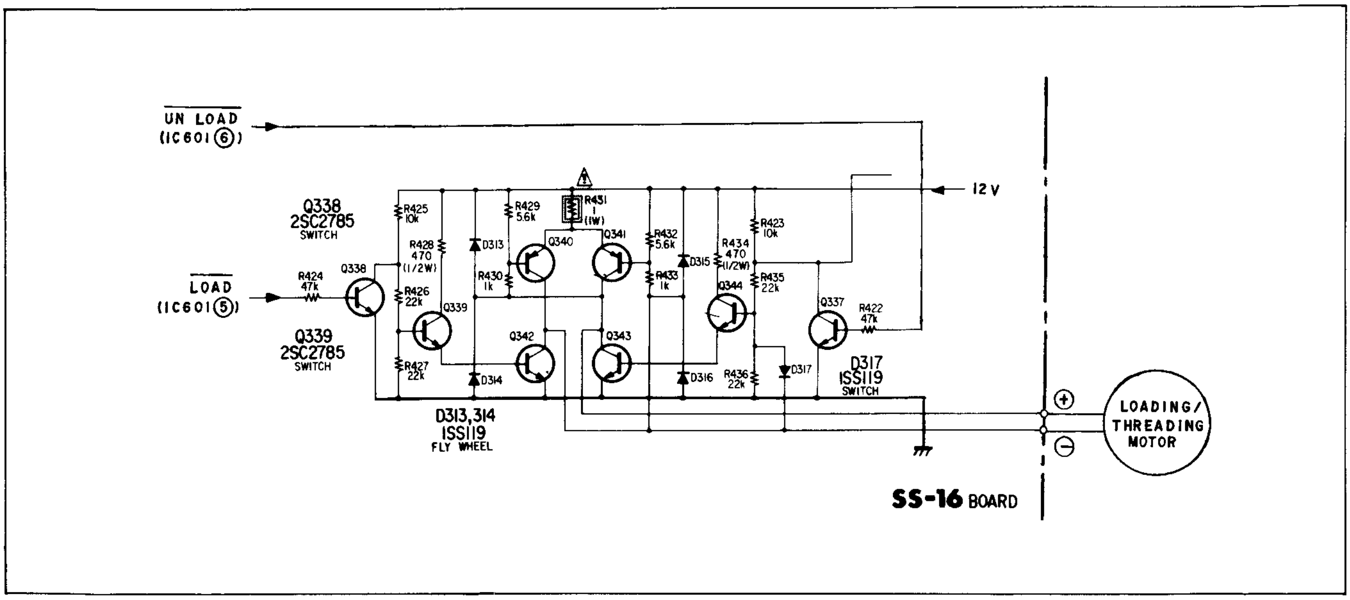

UN LOAD
(IC601⑥)
LOAD
(IC601⑤)
Q338
2SC2785
SWITCH
Q339
2SC2785
SWITCH
R424
47k
Q338
R425
10k
R428
470
(1/2W)
R426
22k
R427
22k
Q339
D313
D314
R430
1k
R429
5.6k
R431
1
(1W)
Q340
Q341
Q342
Q343
D313,314
ISS119
FLY WHEEL
R432
5.6k
R433
1k
D315
D316
R434
470
(1/2W)
Q344
R423
10k
R435
22k
R436
22k
D317
Q337
R422
47k
D317
ISS119
SWITCH
12 V
+
−
LOADING/
THREADING
MOTOR
SS-16 BOARD

*Fig. 2-15. Threading motor drive circuit*

## 2-13. Tape-end Detection Circuit

Tape-end is detected by the S-END sensor (L901) and the T-end sensor (L902). When tape-end is detected, "L" level signals will be input to tape-end input pin ⑧ ($\overline{\mathrm{TEND}}$) of IC601.

If "L" level signals are input to pin ⑧ at the end of the tape, the circuit will automatically go into the REW mode. Change-over to the FWD sensor or REW sensor is carried out by the output (TOP/$\overline{\mathrm{END}}$) of pin ③ of IC601.

| Detection | Mode |
|---|---|
| FWD Sensor | PLAYBACK, RECORD, FF, PICTURE SEARCH (CUE), SKIP SCAN (CUE) |
| REW Sensor | REW, PICTURE SEARCH (REVIEW), SKIP SCAN (REVIEW) |

*Table 2-3.*

### 1. When tape feed is in forward direction

Pin ③ of IC601 will be at "L" level and power will be supplied to the S-END sensor and S-END sensor circuit. As an oscillation circuit is provided in the S-END sensor, this will oscillate at about 630 kHz when the sensing tape at the end of the tape is detected. The oscillation signals are detected by D608 after passing through Q611 and sets Q612 to ON. "L" level signals are then input to tape-end input pin ⑨ of IC601.

### 2. When tape travel is in the rewind direction

Pin ③ of IC601 will be at "H" level and power will be supplied to the TEND sensor circuit by Q608 and Q609. The oscillator circuit composed of the TEND sensor, L902, Q603 and Q604 normally oscillates at 210 kHz. The oscillation signal switches Q606 by means of C608 and D607. 0.2 Vp-p waveforms (⋀⋀) appear at the collector of Q606. If the sensing tape at the starting end of the tape is sensed, the Q of L902 increases and oscillations will stop. Q606 will go OFF and Q607 will go ON when the oscillations stop and "L" level will be input to pin 9 of IC601.

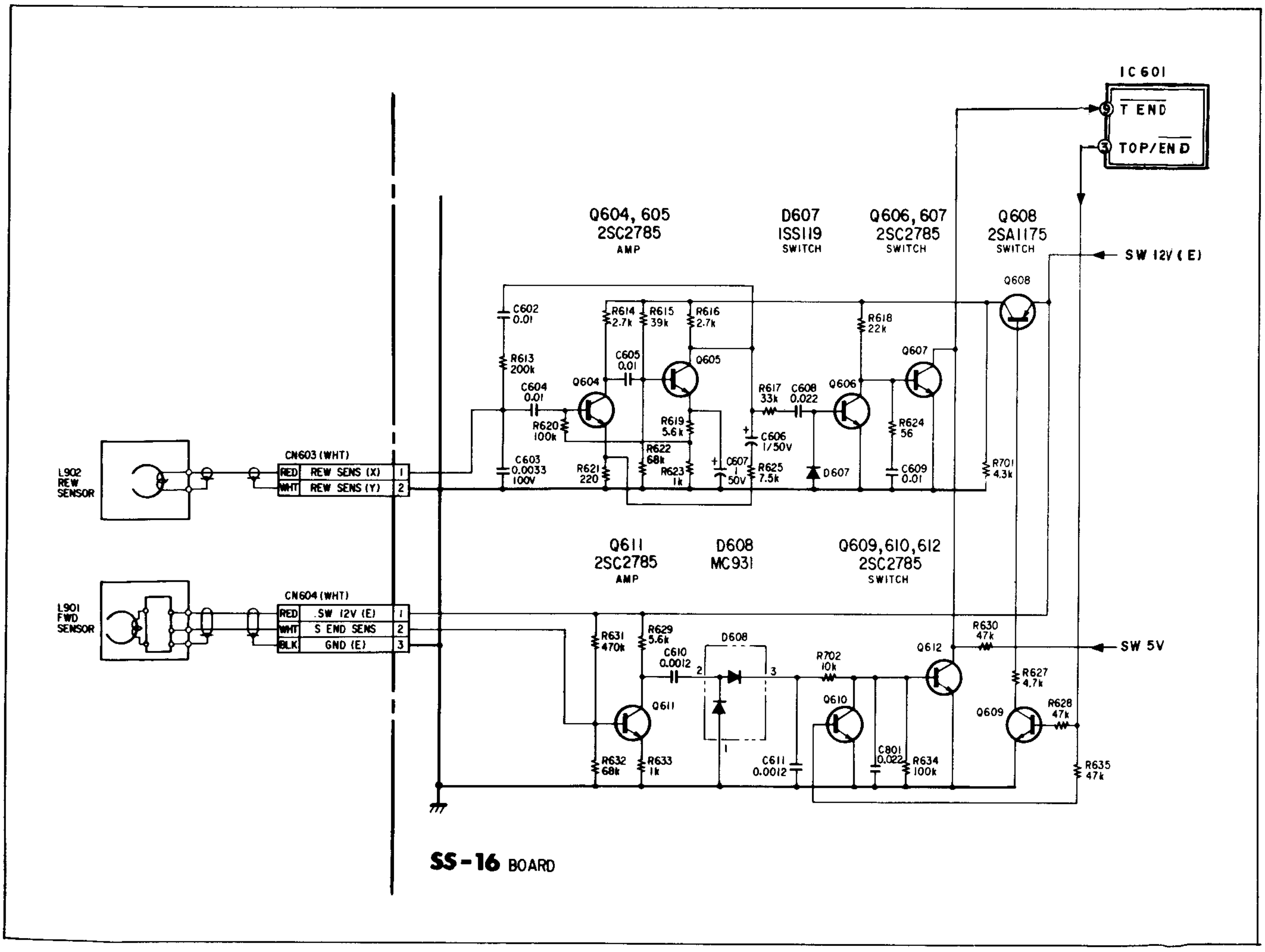

IC601
9 T END
3 TOP/END
Q604, 605
2SC2785
AMP
D607
ISS119
SWITCH
Q606, 607
2SC2785
SWITCH
Q608
2SA1175
SWITCH
SW 12V (E)
Q611
2SC2785
AMP
D608
MC931
Q609, 610, 612
2SC2785
SWITCH
SW 5V
L902
REW
SENSOR
L901
FWD
SENSOR
CN603 (WHT)
RED REW SENS (X) 1
WHT REW SENS (Y) 2
CN604 (WHT)
RED SW 12V (E) 1
WHT S END SENS 2
BLK GND (E) 3
C602 0.01
R613 200k
C604 0.01
R620 100k
C603 0.0033 100V
R621 220
R614 2.7k
R615 39k
R616 2.7k
C605 0.01
Q604
Q605
R619 5.6k
R622 68k
R623 1k
C607 1 50V
C606 1/50V
R625 7.5k
R617 33k
C608 0.022
Q606
D607
R618 22k
Q607
R624 56
C609 0.01
Q608
R701 4.3k
R631 470k
R629 5.6k
C610 0.0012
D608
Q611
R632 68k
R633 1k
C611 0.0012
R702 10k
Q610
C801 0.022
R634 100k
Q612
R630 47k
R627 4.7k
Q609
R628 47k
R635 47k
SS-16 BOARD

*Fig. 2-16. Tape-end detection circuit*

## 2-14. Camera Pause Circuit

Q621, Q624 comprise the camera pause circuit REC 12V is used as the power supply of this circuit. VTR RECORD and REC • PAUSE operations can be controlled alternately by the start/stop button on the camera by connecting a camera and a VTR through the camera adapter when recording with a camera. On the camera side, the CAMERA PAUSE terminal voltage is used, when the VTR is operating in the RECORD mode, to light the TALLY lamp.

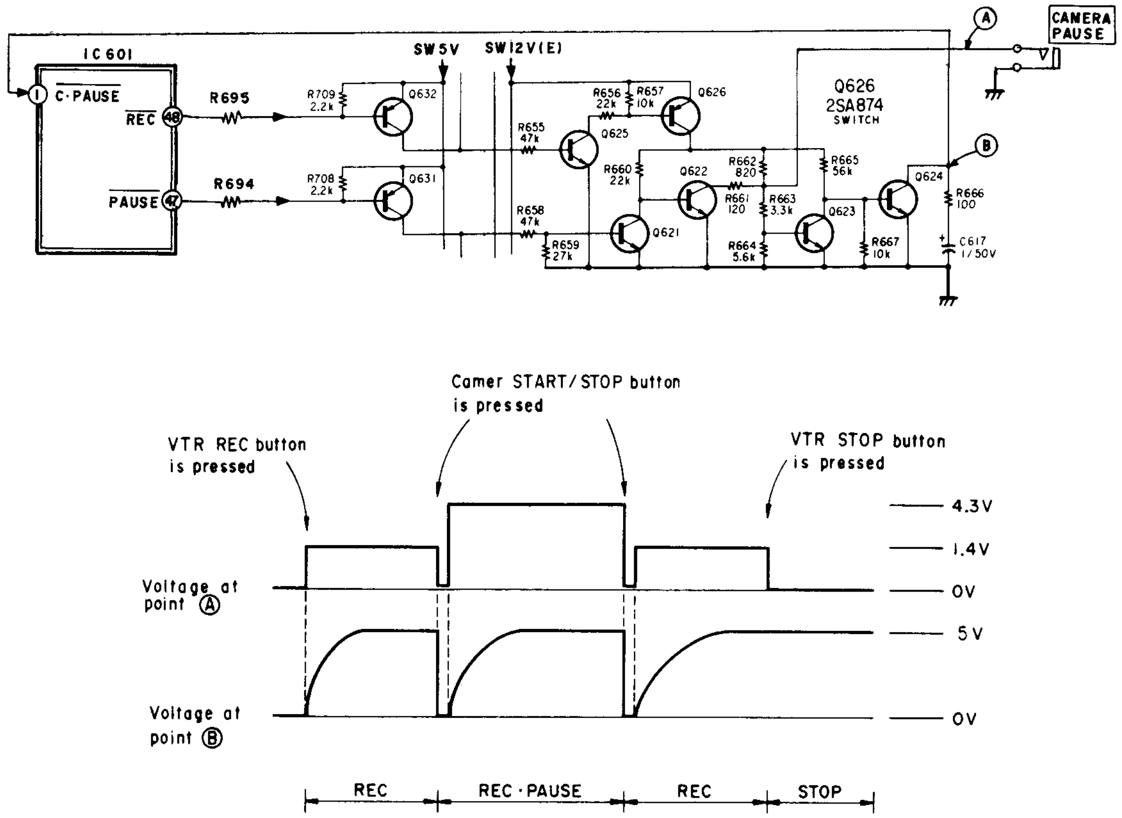

IC601
1 C·PAUSE
REC 48
PAUSE 47
R695
R694
R709 2.2k
R708 2.2k
Q632
Q631
SW5V
SW12V(E)
R655 47k
R658 47k
R659 27k
Q625
R656 22k
R657 10k
Q626
R660 22k
Q621
Q622
R662 820
R661 120
R663 3.3k
R664 5.6k
Q623
R665 56k
Q626
2SA874
SWITCH
Ⓐ
CAMERA PAUSE
Ⓑ
Q624
R666 100
R667 10k
C617 1/50V
Camer START/STOP button is pressed
VTR REC button is pressed
VTR STOP button is pressed
4.3V
1.4V
0V
5V
0V
Voltage at point Ⓐ
Voltage at point Ⓑ
REC
REC·PAUSE
REC
STOP

*Fig. 2-17. Camera pause circuit*

## 2-15. Solenoid and Motor Operation for Modes

| MOTOR FL<br>OPERATION MODE | DRUM MOTOR | CAPSTAN MOTOR | REEL MOTOR | LOADING/ THREADING MOTOR | UNBRAKE SOLENOID | PINCH SOLENOID |
|---|---|---|---|---|---|---|
| PB or REC | ON | ON | ON | OFF | ON | ON |
| PB·PAUSE or REC·PAUSE | ON | ON | OFF | OFF | OFF | OFF |
| FF | ON | OFF | ON | OFF | ON | OFF |
| REW | ON | OFF | ON | OFF | ON | OFF |
| SKIP SCAN (CUE) | ON | ON | ON | OFF | ON | OFF |
| SKIP SCAN (REV) | ON | ON | ON | OFF | ON | OFF |
| THREADING | OFF | OFF | ON | ON | OFF | OFF |
| UNTHREADING | OFF | OFF | ON | ON | OFF | OFF |
| LOADING | OFF | OFF | OFF | ON | OFF | ON |
| UNLOADING | OFF | OFF | OFF | ON | OFF | ON |
| PICTURE SEARCH (CUE) | ON | ON | ON | OFF | ON | ON |
| PICTURE SEARCH (REV) | ON | ON | ON | OFF | ON | ON |
| STOP | OFF | OFF | OFF | OFF | OFF | OFF |

*Table 2-4*

## 2-16. Data Transfer with the REMOCON/TIMER Microcomputer

Exchange of various information is carried out between the SYSCON microcomputer and the REMOCON/TIMER microcomputer by means of data transfer.

The respective microcomputers are provided with a shift register as internal hardware and transmission and reception of 24 bit data will be possible at one time by mutually taking over these inputs and outputs. The internal clock on the SYSCON side is used for the transfer clock pulses. Mutual synchronization is also carried out by receiving $\overline{\text{RTRQST}}$ signals from REMOCON/TIMER.

The data transferred are as follows.

a) SYSCON to REMOCON/TIMER
   1. Counter information (BCD 4 bytes)
   2. REC • $\overline{\text{P}}$. PB + DUB. Auto Rewind and STOP signals

b) REMOCON/TIMER to SYSCON
   1. Counter Display. Timer Rec. and Power OFF signals
   2. Remote control information
   3. Booked-up counter information (Only once during Power ON)

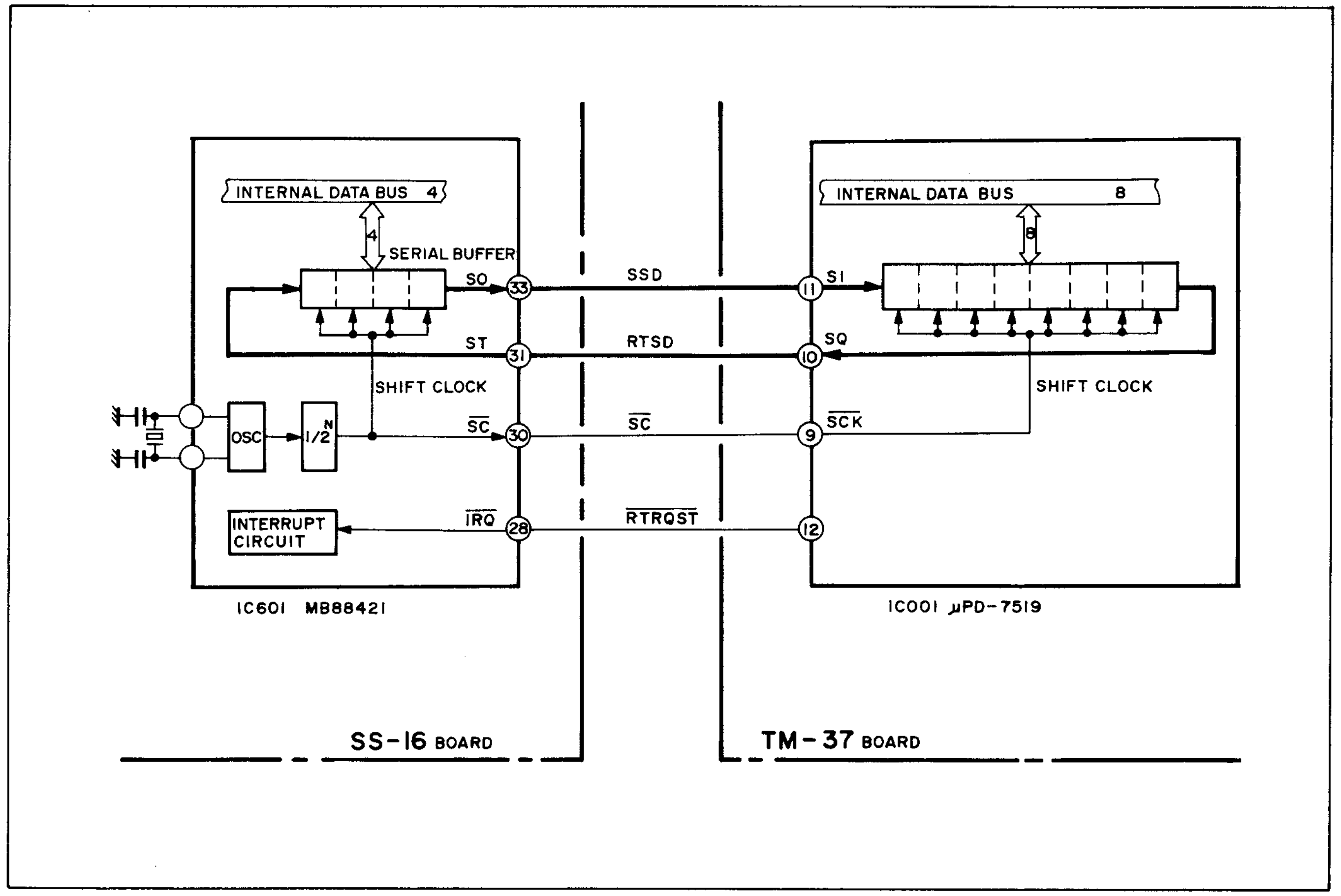

INTERNAL DATA BUS 4
4
SERIAL BUFFER
SO
33
ST
31
SHIFT CLOCK
OSC
N
1/2
SC
30
INTERRUPT CIRCUIT
IRQ
28
IC601 MB88421
SSD
RTSD
SC
RTRQST
INTERNAL DATA BUS 8
8
SI
11
SQ
10
SHIFT CLOCK
SCK
9
12
IC001 μPD-7519
SS-16 BOARD
TM-37 BOARD

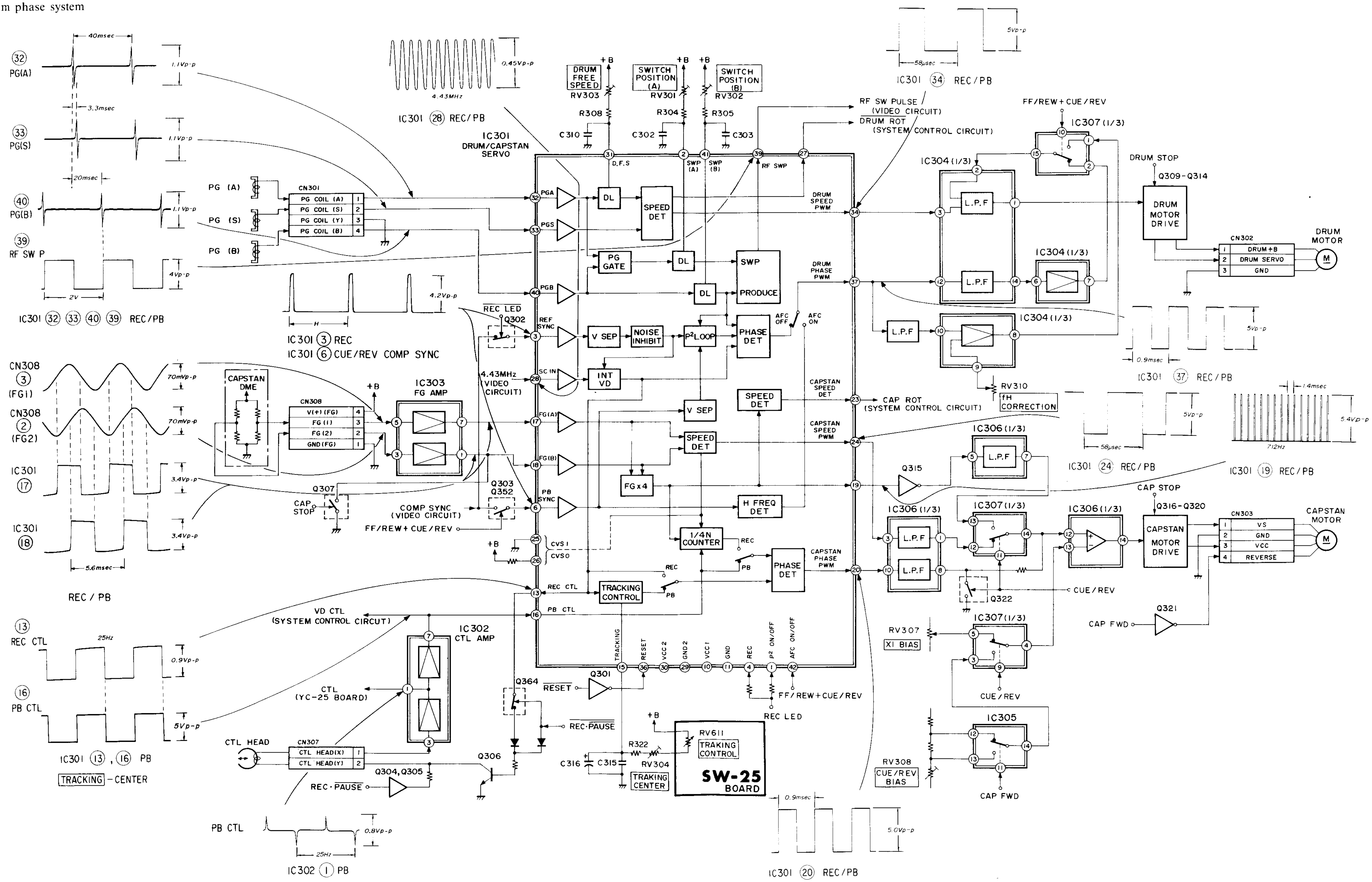
*Fig. 2-18. SYSCON — REMOCON/TIMER data transfer block diagram*

## 3. SERVO CIRCUITRY

The servo circuitry consists of the following four circuits one the SS-16 board:

1. Drum speed system
2. Drum phase system
3. Capstan speed system
4. Capstan phase system

Fig. 3-1 is a block diagram showing these circuits.



(32) PG(A)
40msec
1.1Vp-p
3.3msec
(33) PG(S)
20msec
(40) PG(B)
(39) RF SW P
4Vp-p
2V
IC301 (32) (33) (40) (39) REC/PB
CN308 (3) (FG1)
70mVp-p
CN308 (2) (FG2)
IC301 (17)
3.4Vp-p
IC301 (18)
5.6msec
REC / PB
(13) REC CTL
25Hz
0.9Vp-p
(16) PB CTL
5Vp-p
IC301 (13), (16) PB
TRACKING - CENTER
0.45Vp-p
4.43MHz
IC301 (28) REC/PB
IC301 DRUM/CAPSTAN SERVO
PG (A)
PG (S)
PG (B)
CN301
PG COIL (A) 1
PG COIL (S) 2
PG COIL (Y) 3
PG COIL (B) 4
4.2Vp-p
H
IC301 (3) REC
IC301 (6) CUE/REV COMP SYNC
REC LED
Q302
CAPSTAN DME
+B
CN308
V(+) (FG) 4
FG (1) 3
FG (2) 2
GND (FG) 1
IC303 FG AMP
Q307
CAP STOP
COMP SYNC (VIDEO CIRCUIT)
FF/REW+CUE/REV
Q303 Q352
4.43MHz VIDEO CIRCUIT)
VD CTL (SYSTEM CONTROL CIRCUT)
IC302 CTL AMP
CTL (YC-25 BOARD)
CTL HEAD
CN307
CTL HEAD (X) 1
CTL HEAD (Y) 2
Q304, Q305
REC·PAUSE
Q306
Q364
RESET
REC·PAUSE
PB CTL
0.8Vp-p
25Hz
IC302 (1) PB
DRUM FREE SPEED
RV303
R308
C310
SWITCH POSITION (A)
RV301
R304
C302
SWITCH POSITION (B)
RV302
R305
C303
D.F.S
SWP (A)
SWP (B)
RF SWP
PGA
PGS
PGB
REF SYNC
SC IN
FG(A)
FG(B)
PB SYNC
CVS I
CVSO
REC CTL
PB CTL
DL
SPEED DET
PG GATE
SWP
PRODUCE
V SEP
NOISE INHIBIT
P²LOOP
PHASE DET
AFC OFF
AFC ON
INT VD
SPEED DET
V SEP
SPEED DET
FGx4
H FREQ DET
1/4N COUNTER
REC
PB
PHASE DET
TRACKING CONTROL
TRACKING
RESET
VCC 2
GND 2
VCC 1
GND
REC
P2 ON/OFF
AFC ON/OFF
Q301
FF/REW+CUE/REV
REC LED
+B
RV611
TRAKING CONTROL
R322
C316
C315
RV304
TRAKING CENTER
SW-25 BOARD
DRUM SPEED PWM
DRUM PHASE PWM
CAPSTAN SPEED DET
CAPSTAN SPEED PWM
CAPSTAN PHASE PWM
RF SW PULSE (VIDEO CIRCUIT)
DRUM ROT (SYSTEM CONTROL CIRCUIT)
CAP ROT (SYSTEM CONTROL CIRCUIT)
5Vp-p
58μsec
IC301 (34) REC/PB
FF/REW+CUE/REV
IC307 (1/3)
IC304 (1/3)
L.P.F
DRUM STOP
Q309-Q314
DRUM MOTOR DRIVE
CN302
1 DRUM+B
2 DRUM SERVO
3 GND
DRUM MOTOR
M
L.P.F
RV310
fH CORRECTION
0.9msec
IC301 (37) REC/PB
1.4msec
5.4Vp-p
712Hz
IC301 (19) REC/PB
58μsec
IC301 (24) REC/PB
IC306 (1/3)
Q315
CAP STOP
Q316-Q320
CAPSTAN MOTOR DRIVE
CN303
1 VS
2 GND
3 VCC
4 REVERSE
CAPSTAN MOTOR
Q322
CUE/REV
Q321
CAP FWD
RV307
XI BIAS
CUE/REV
IC305
RV308
CUE/REV BIAS
CAP FWD
0.9msec
5.0Vp-p
IC301 (20) REC/PB

Fig. 3-1. Block diagram

Each servo circuit requires two input signals. IC301 is a digital servo IC which measures the phase difference between those two input signals and produces an error output in the form of a pulse-width-modulated wave (PWM) signal. This signal is then used to control the motor. The relationship between the motor speed and PWM signal is given in Fig. 3-2.

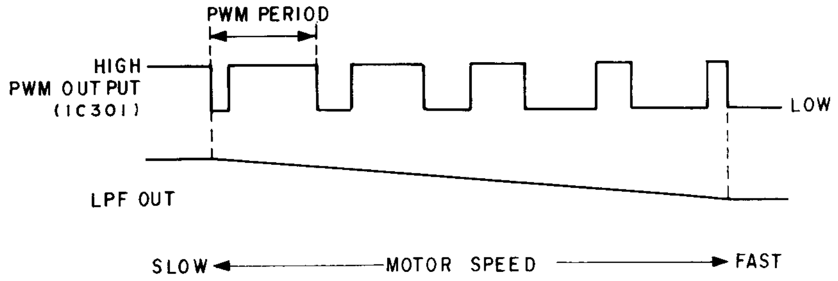


*Fig. 3-2. Relationship between motor speed and PWM output*

### 3-1. Drum System Servo Circuitry

The drum speed servo circuit is used in playback and record. It determines the drum rotational speed by detecting the PG(A) and PG(S) pulses, producing the drum speed PWM signal output as a speed error signal from pin ㉞ of IC301.
During recording, the drum phase system servo circuit compares the PG(B) pulse with the VD (vertical drive) signal separated from the composite synchronous (COMP SYNC) signal. This produces a phase error signal which exits from pin ㊲ of IC301 as the drum phase PWM signal.
During playback, the phase of the INT VD signal (after a 4.43 MHz countdown) and the phase of PG(B) signal are compared. The output of the phase detector is the drum phase PWM signal exiting at pin ㊲ . The PWM signal, after being converted to a DC voltage in the active Low Pass Filter (LPF) circuit of IC304 (pins ⑩ and ⑧) and then is mixed with a signal from pin ⑭ of IC307. This mixed signal is applied to the drum motor drive circuit as a drum error signal.
During picture search and skip scan, the COMP SYNC signal applied to pin ⑥ of IC301, triggers a MMV, resulting in the AFC OUT signal which exits from pin ㊲ . $f_H$ correction occurs as will be explained later in this section.

#### 1. PG Signal

The PG pulse generates a single wave for one revolution of the drum for each of the coils PG(A), PG(S), and PG(B). These pulses are input into pins ㉜, ㉝, and ㊵ of IC301, respectively. The PG(A) and PG(B) pulses are input to the MMV used for adjusting the switching position. After the switching position is set by means of RV301 connected to pin ② and RV302 connected to pin ㊶, respectively, a switch pulse is output from pin ㊴ for use as a RF SWITCH PULSE.

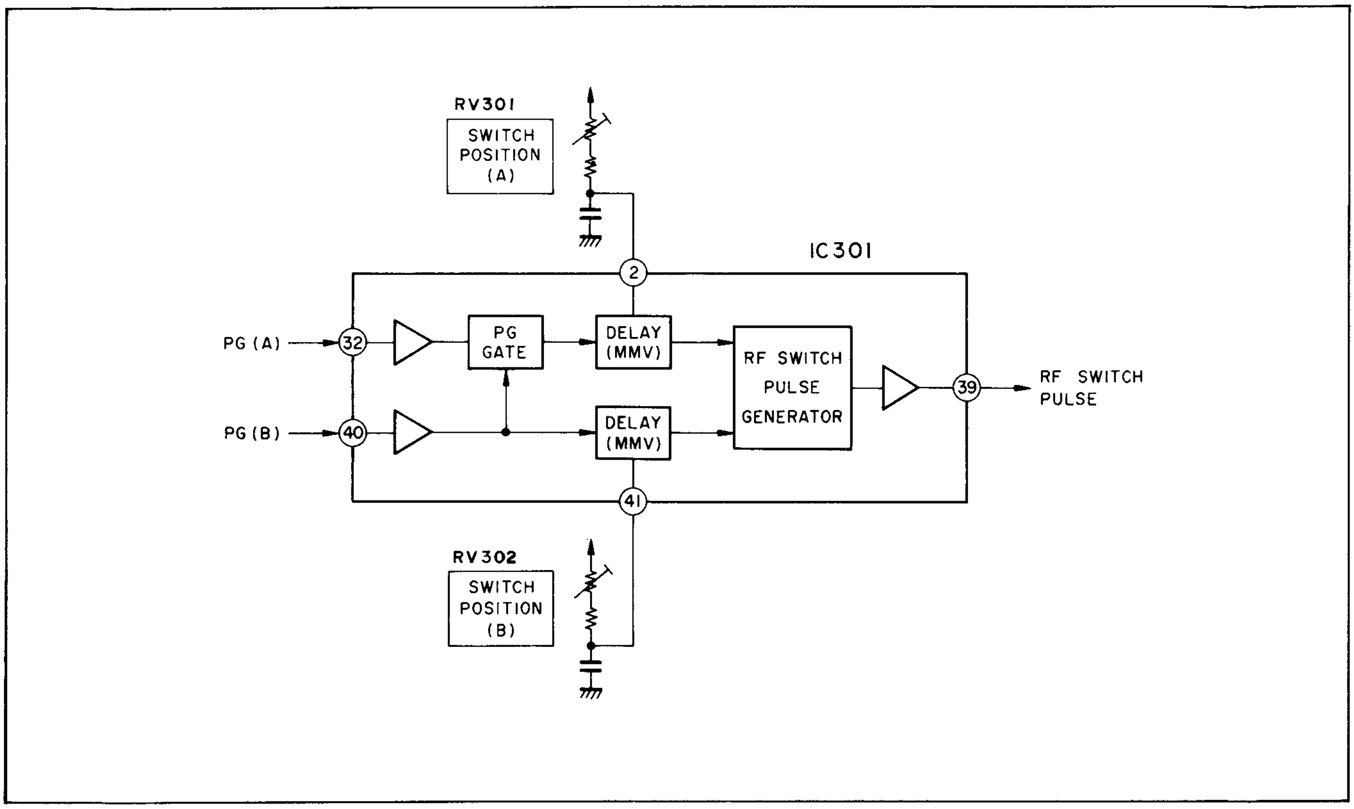

RV301
SWITCH POSITION (A)
IC301
2
PG (A)
32
PG GATE
DELAY (MMV)
RF SWITCH PULSE GENERATOR
39
RF SWITCH PULSE
PG (B)
40
DELAY (MMV)
41
RV302
SWITCH POSITION (B)

*Fig. 3-3. RF switch pulse generator of IC301*

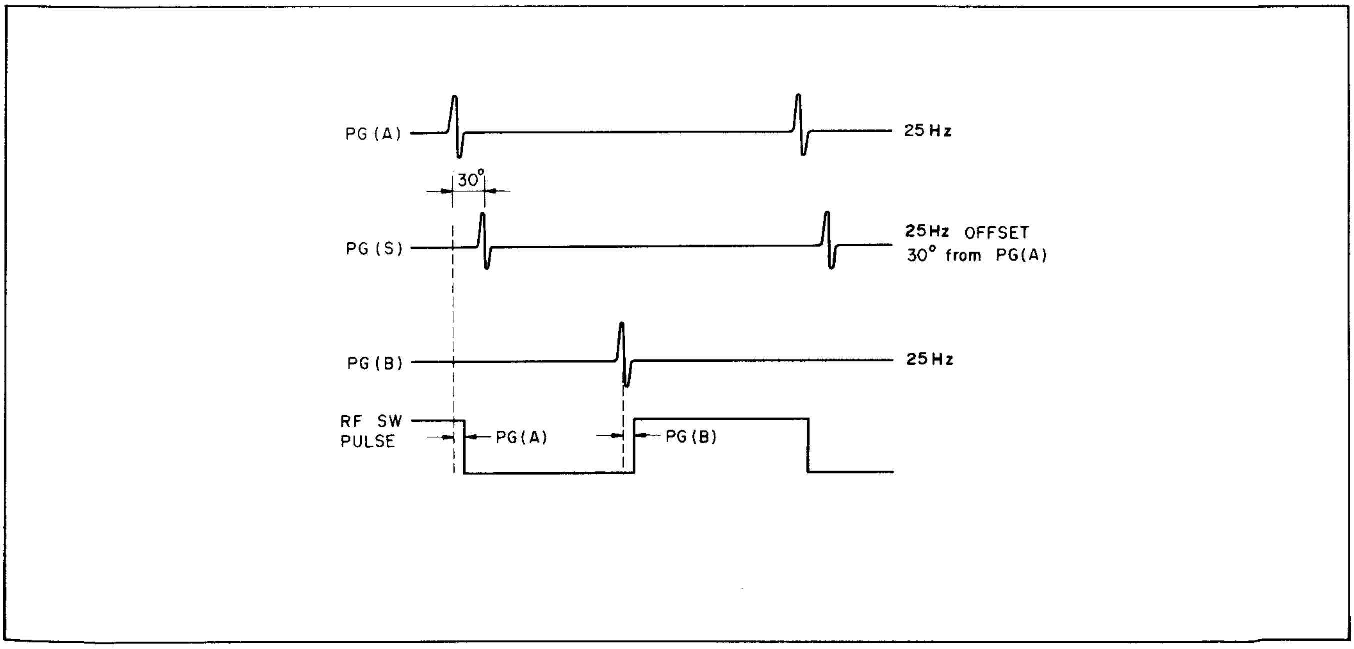


*Fig. 3-4. Drum PG waveforms*

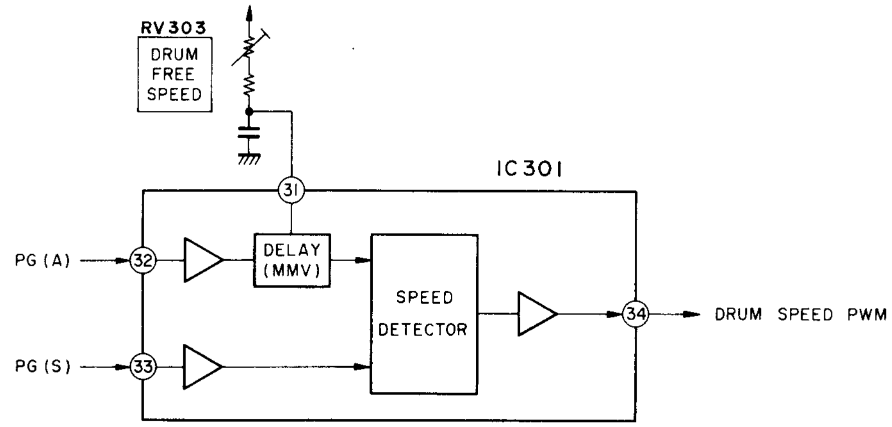

RV303
DRUM FREE SPEED
IC301
31
PG (A)
32
DELAY (MMV)
SPEED DETECTOR
34
DRUM SPEED PWM
PG (S)
33

*Fig. 3-5. Drum speed system of IC301*

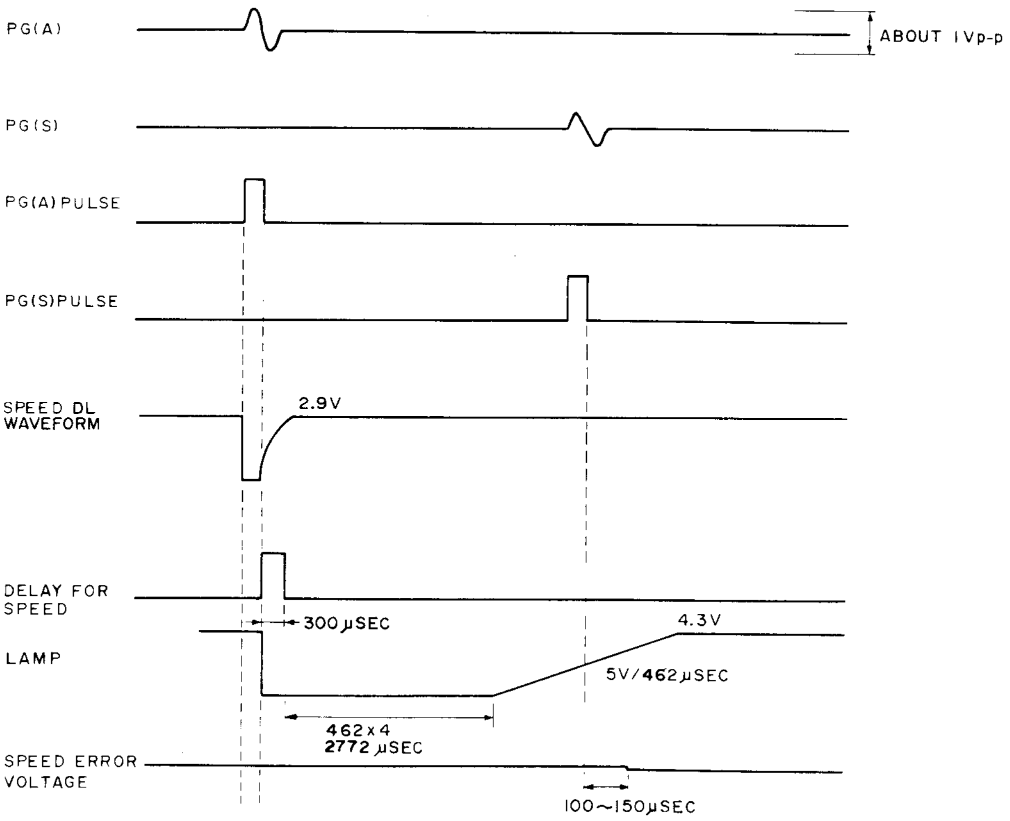

PG(A)
ABOUT 1Vp-p
PG(S)
PG(A)PULSE
PG(S)PULSE
SPEED DL WAVEFORM
2.9V
DELAY FOR SPEED
300μSEC
LAMP
4.3V
5V/462μSEC
462×4
2772μSEC
SPEED ERROR VOLTAGE
100~150μSEC

*Fig. 3-6. Drum speed system timing diagram*

## 2. Speed System

The PG(A) pulse applied to pin ㉜ of IC301 enters the drum free speed setting MMV. After the drum free speed is set, by RV303 connected to pin ㉛, this pulse is applied to the speed detection circuit. Also, the PG(S) pulse input to pin ㉝ enters the speed detection circuit without change. The difference between these two PG pulses is measured in the speed detection circuit, providing a drum speed error signal which exits from pin ㉞ as a drum speed PWM signal. (See Fig. 3-5,3-6)

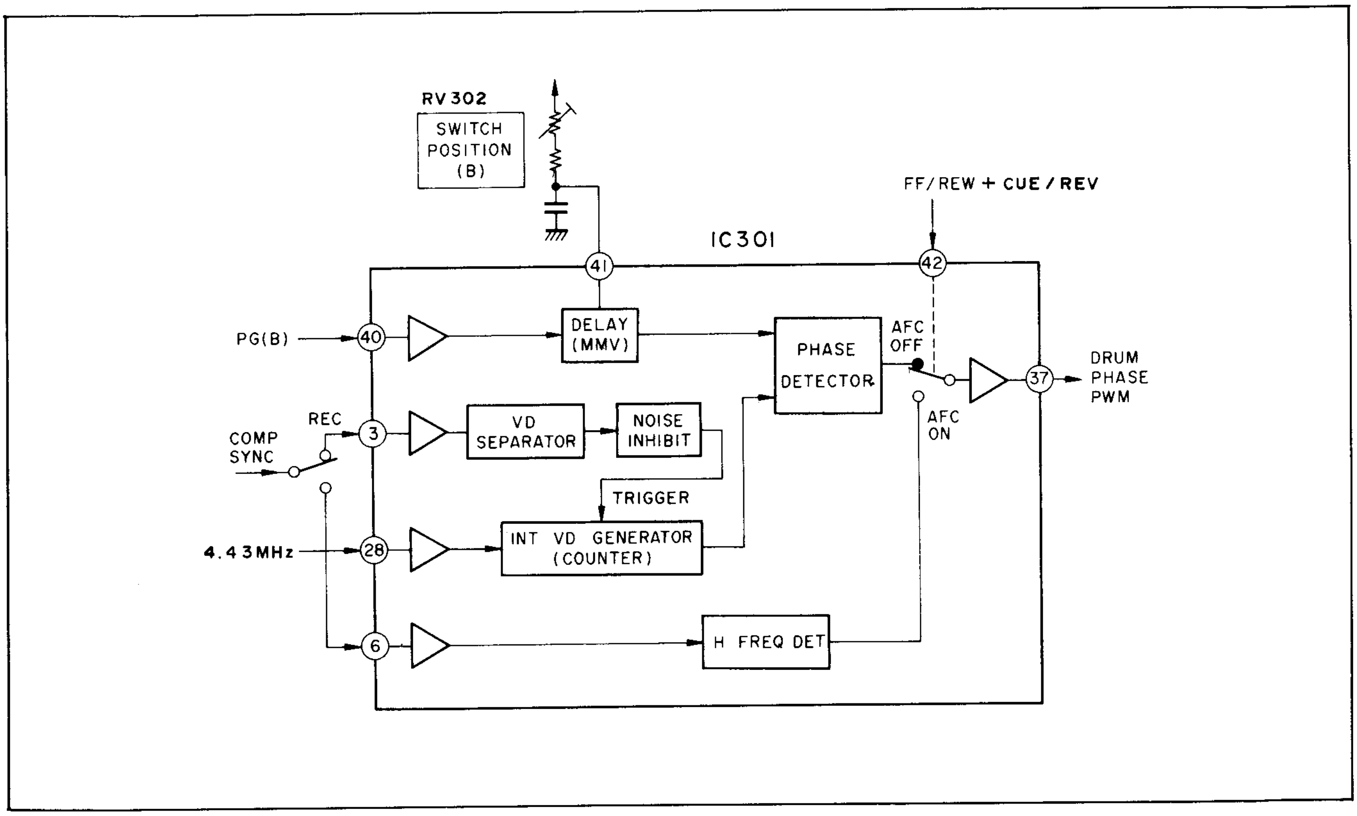

RV302
SWITCH POSITION (B)
FF/REW + CUE / REV
IC301
41
42
PG(B)
40
DELAY (MMV)
PHASE DETECTOR
AFC OFF
AFC ON
37
DRUM PHASE PWM
REC
COMP SYNC
3
VD SEPARATOR
NOISE INHIBIT
TRIGGER
4.43MHz
28
INT VD GENERATOR (COUNTER)
6
H FREQ DET

*Fig. 3-7. Drum phase system of IC301*

## 3. Phase System

**[Recording]**

In IC301, the VD signal is separated from the COMP SYNC signal applied to pin ③ of IC301. Also, the 4.43 MHz signal applied to pin ㉘ becomes the INT VD signal after countdown. At this time, the INT VD signal is synchronous with the VD signal because it is triggered by the VD signal. The phase error voltage obtained by measuring the phase difference of the INT VD signal and the PB(B) pulse exits from pin ㊲ as a drum phase PWM signal.

**[Playback]**

There is no input to pin ③ of IC301 during playback and the 50 Hz INT VD signal (which is the 4.43 MHz signal applied to pin ㉘ counted down in 1/88680) becomes the INT VD signal. The phase difference of this signal and the PG(B) pulse is measured and a phase error voltage is developed.

| Mode | Servocontrollable signal | Reference signal | |
|---|---|---|---|
| REC | PG(B) | VD | Separated from video signal |
| P.B | PG(B) | INT.VD | VD by internal crystal oscillator |

*Table 3-1. Drum phase system*

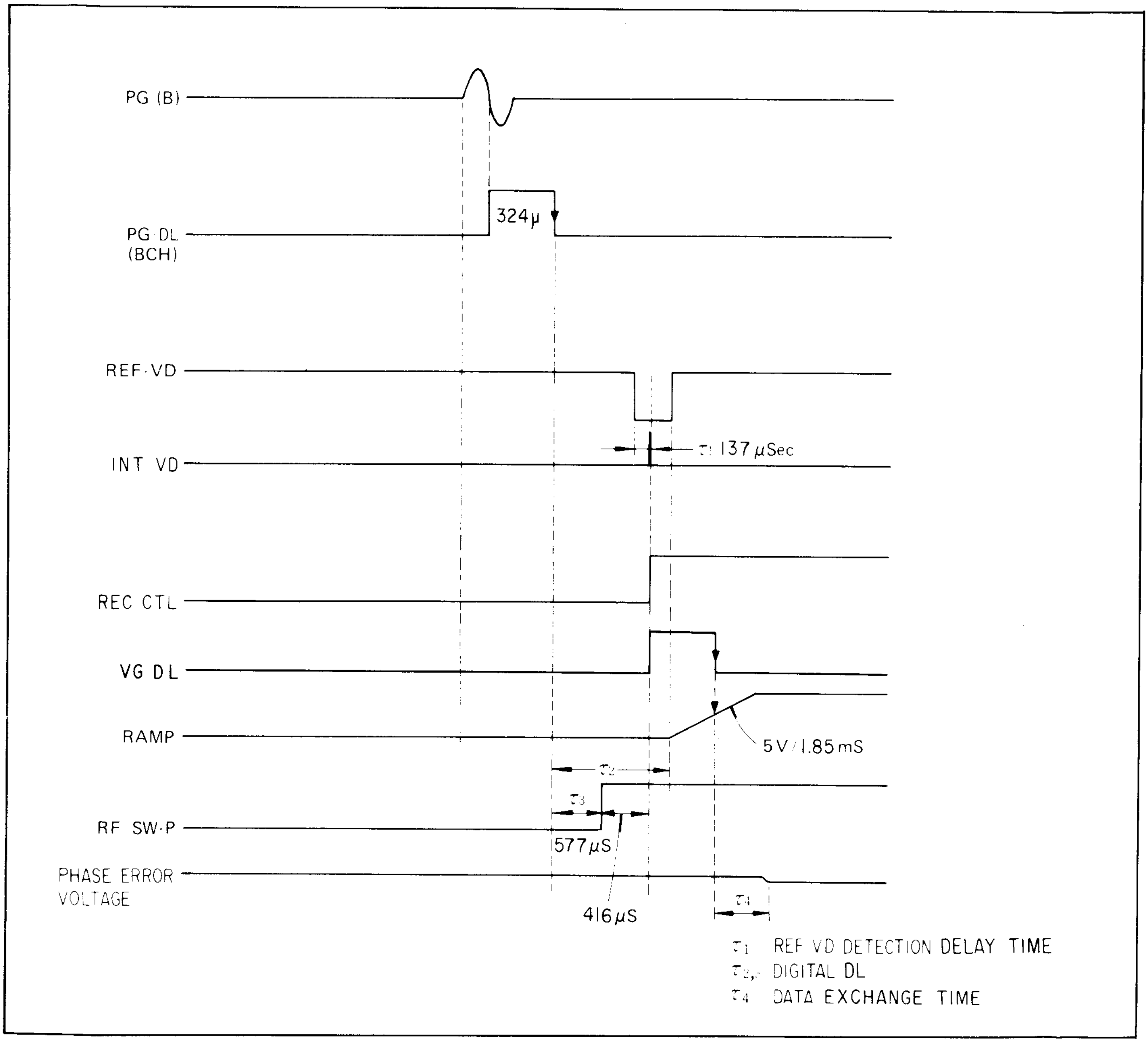

PG (B)
PG DL (BCH)
324μ
REF·VD
INT VD
τ1 137μSec
REC CTL
VG DL
RAMP
5V/1.85mS
τ2
τ3
RF SW·P
577μS
416μS
PHASE ERROR VOLTAGE
τ4
τ1 REF VD DETECTION DELAY TIME
τ2,3 DIGITAL DL
τ4 DATA EXCHANGE TIME

*Fig. 3-8. Drum phase system timing diagram*

**4. Low-pass Filter and Mixing Circuit**

The Drum Phase PWM output from pin ㊲ of IC301 is applied to the active Low Pass Filter (LPF), pin ⑫ of IC304, converted to a DC voltage, and then exits IC304 at pin ⑭. This Drum Phase Error signal, after amplification between pin ⑥ and pin ⑦ of IC304, is applied to pin ② of analog switch IC307, exiting pin ⑭ and is then applied to pin ② of IC304. At the same time, the Drum Speed PWM output from pin ㉞ of IC301, after being converted to a DC voltage in the LPF pin ③ of IC304, mixed with the drum phase error signal from pin ② and output from pin ① as a drum error signal.

## 3-2. Capstan System Servo Circuitry

The capstan speed system servo circuitry measures the time difference of the FG(1) and FG(2) signals to obtain the speed error voltage. FG signals are sine waves obtained by detecting the magnetic field at the outer circumference of the capstan motor by a DME (dividing-type magnetic resistance element). The capstan speed error voltage exits IC301 at pin ㉔. The capstan phase system servo circuitry develops the record mode phase error voltage by measuring the phase difference of the counted down FG signal with the 50 Hz INT VD signal synchronous with the VD signal separated from the video input signal. On playback, the phase error voltage is obtained by measuring the phase difference between the INT VD signal from counting down 4.43 MHz, and the playback CTL signal from the CTL head.

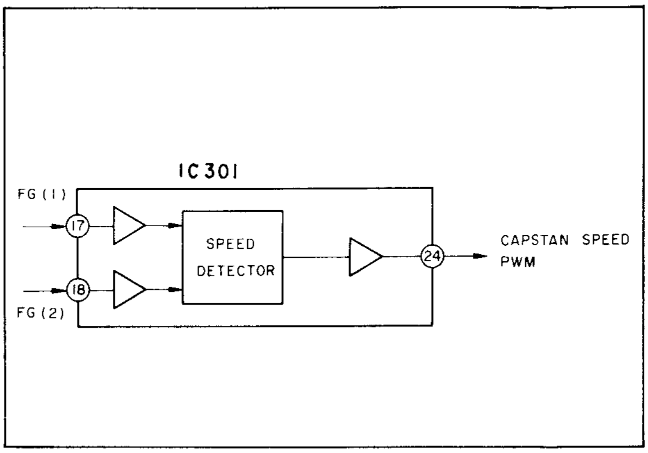

IC301
FG (1)
17
18
FG (2)
SPEED DETECTOR
24
CAPSTAN SPEED PWM

*Fig. 3-9. Capstan speed system of IC301*

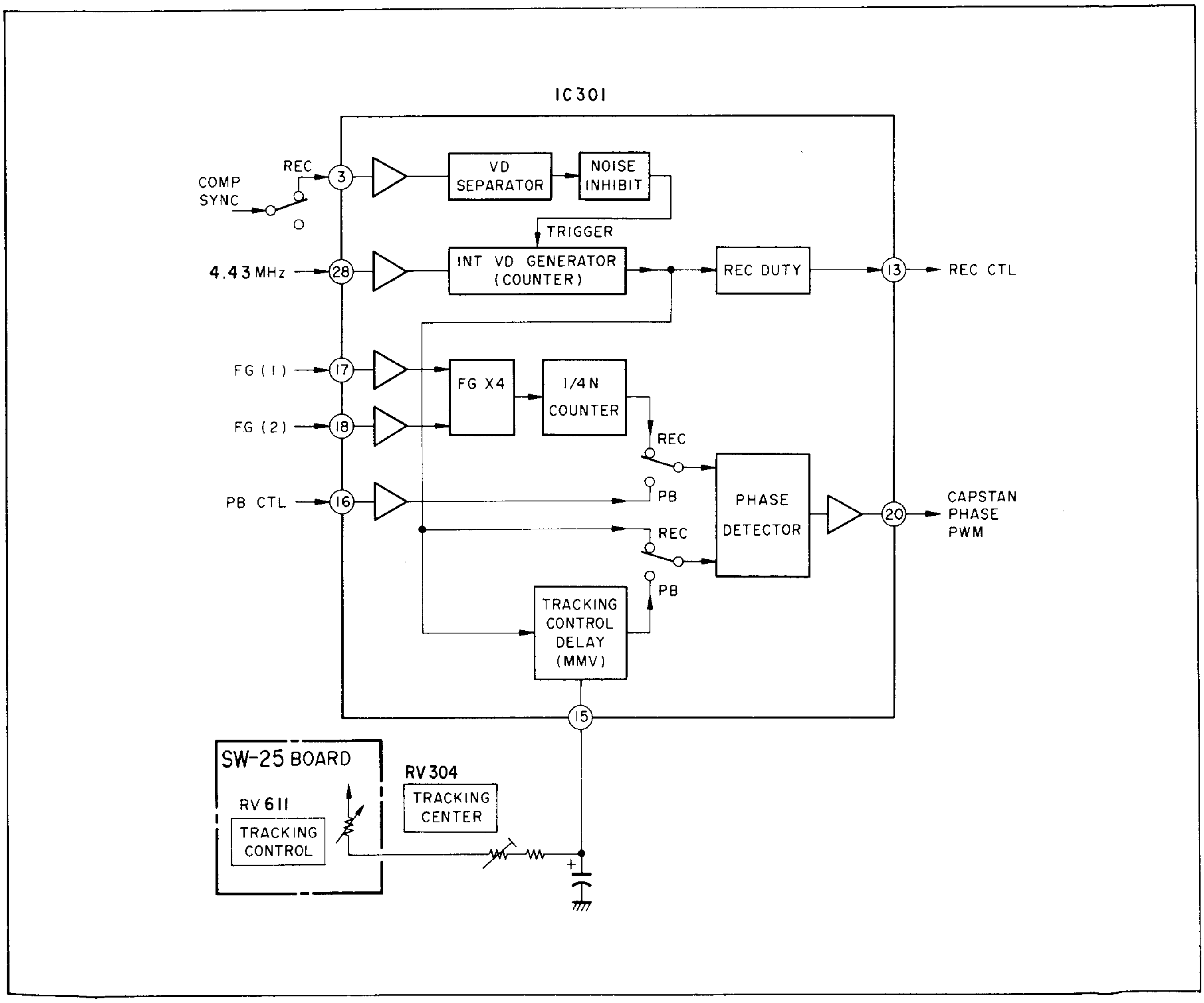

IC301
COMP SYNC
REC
3
VD SEPARATOR
NOISE INHIBIT
TRIGGER
4.43 MHz
28
INT VD GENERATOR (COUNTER)
REC DUTY
13
REC CTL
FG (1)
17
FG (2)
18
FG X4
1/4N COUNTER
REC
PB
PB CTL
16
REC
PB
PHASE DETECTOR
20
CAPSTAN PHASE PWM
TRACKING CONTROL DELAY (MMV)
15
SW-25 BOARD
RV611
TRACKING CONTROL
RV304
TRACKING CENTER
+

*Fig. 3-10. Capstan phase system of IC301*

## 1. Speed System

FG(1) and FG(2) signals are of a frequency proportional to the RPM of the capstan motor (two sine wave signals with a 90 deg phase difference) and are applied to pin ⑤ and pin ③ of IC303 respectively. In IC303 the signals are converted to rectangular waveforms and are output from pin ⑦ and pin ① of IC303 into pin ⑰ and pin ⑱ of IC301 respectively. In IC301, the time difference of the two FG signals is measured and the resulting speed voltage error is output as a Capstan Speed PWM from pin ㉔ .

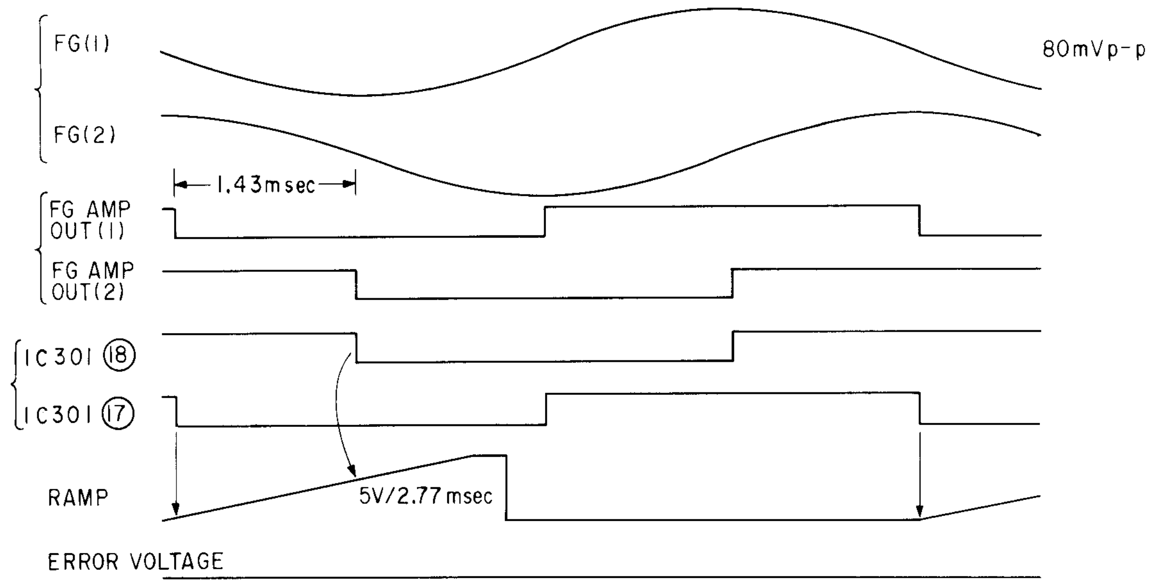


*Fig. 3-11. Capstan speed system timing diagram*

## 2. Phase System

If only a speed system servo were used, variation in tape speed could readily occur because of temperature changes and changes due to aging of components, therefore phase servo control is also applied.

**[Recording]**

An INT VD signal is triggered with a VD signal separated from the COMP SYNC signal applied to pin ③ of IC301. The phase of this VD signal (the synchronous VD signal) is compared with the signal obtained by counting down the FG signal input from pins ⑰ and ⑱ . This phase comparison takes place in a phase detection circuit with the phase error voltage output from pin ⑳ of IC301 as a Capstan Phase PWM.

Also, the INT VD signal is output from pin ⑬ of IC301 as a REC CTL signal and recorded on the tape using the CTL head.

**[Playback]**

In order that the video head will accurately trace the video track on the tape, the CTL signal is used as a tape position signal. After being amplified in IC302, the CTL signal played back from the CTL head is transformed into a rectangular wave and input to pin ⑯ of IC301 where it is applied to the phase defector. At the same time, the INT VD signal obtained by counting down the 4.43 MHz signal input via pin ㉘ is used as the reference signal. This signal, after being delayed in the tracking control circuit, also enters the phase detector circuit in which its phase is compared with that of the CTL signal from pin ⑯. In the tracking control circuit, the amount of tracking control is determined by the amount of delay of the INT VD signal as selected by adjustment of TRACKING CONTROL VR611 (on the SW-25 board) connected to pin ⑮. The phase error voltage obtained by measuring the phase difference is output from pin ⑳ of IC301 as a Capstan Phase PWM signal.

| Mode | Servocontrollable signal | Reference Signal |
|---|---|---|
| REC | CAP FG divided to 30 Hz | VD |
| P. B | CTL | TRACON Monomulti Output |

*Table 3-2. Capstan phase system*

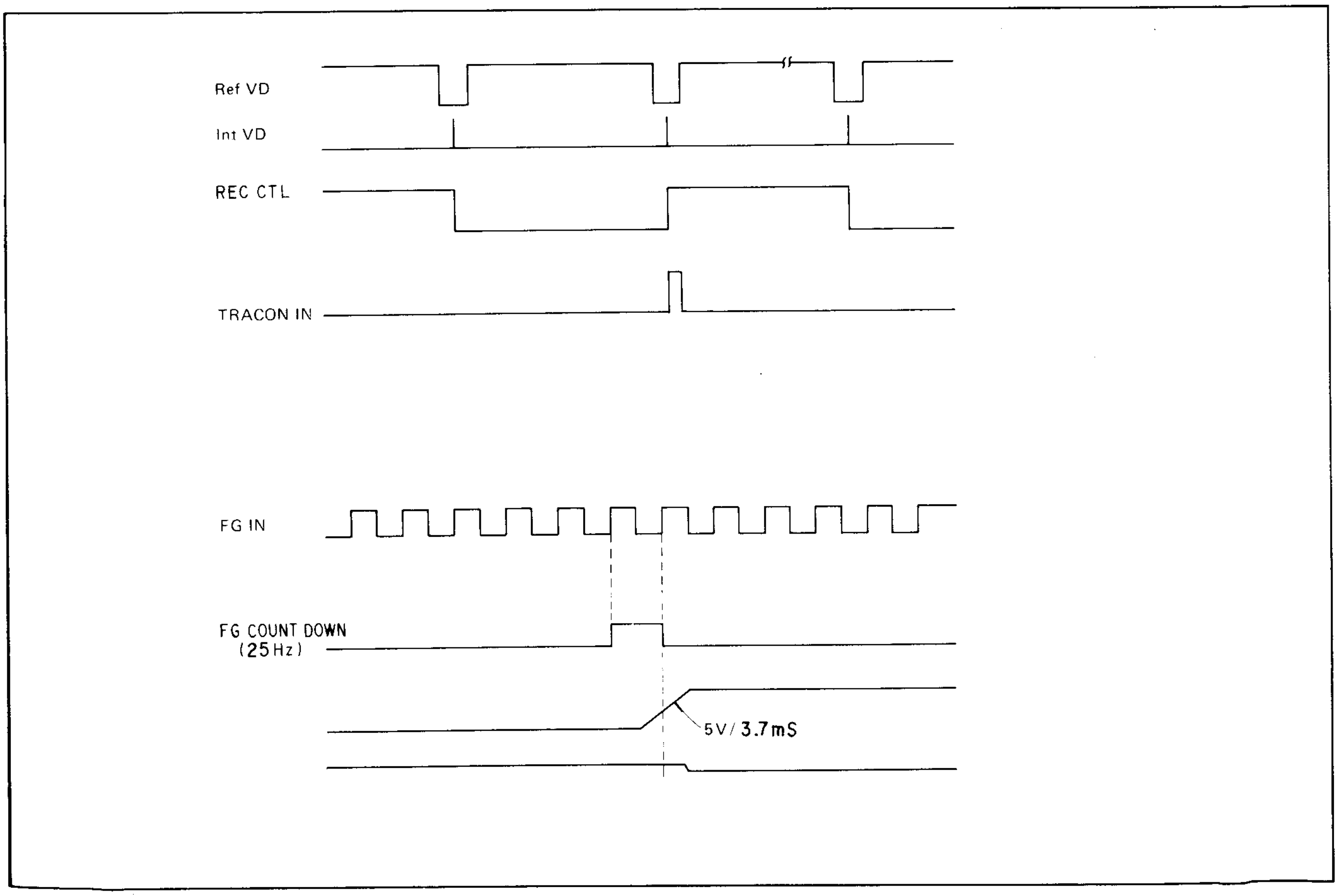


*Fig. 3-12. Capstan phase system (REC) timing diagram*

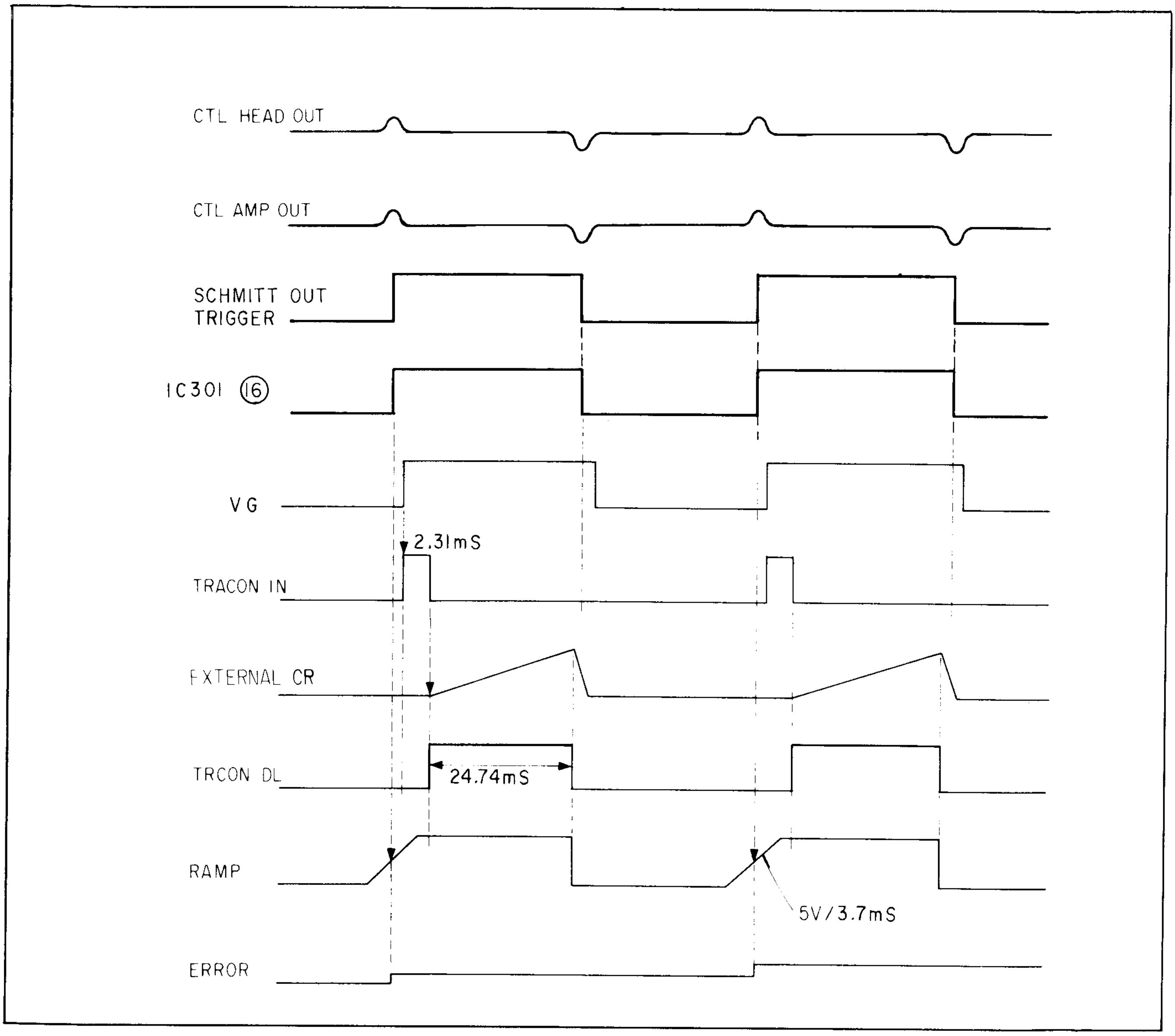

CTL HEAD OUT
CTL AMP OUT
SCHMITT OUT
TRIGGER
IC301 ⑯
VG
2.31mS
TRACON IN
EXTERNAL CR
TRCON DL
24.74mS
RAMP
5V/3.7mS
ERROR

*Fig. 3-13. Capstan phase system (PB) timing diagram*

### 3. Low-phase Filter

The capstan speed PWM signal from pin ㉔ of IC301 is converted to a DC voltage in the Low Pass Filter (LPF) associated with pin ③ of IC306 and output from pin ① as a speed error signal. Also, the capstan phase PWM signal from pin ⑳ of IC301 is converted to a DC voltage in the LPF associated with ⑩ of IC306 and output from pin ⑧ as a phase error signal. These two error signals (from pins ① and ⑧ are mixed, becoming a capstan error signal applied to pin ⑫ of IC306.

## 3-3. fH Correction Circuit

The tape transport speed in the picture search mode becomes approximately 9 time as high as that in the normal playback mode, and the speed in the skip scan mode becomes 11 times on the overage. The relative speed between the video head and the tape is greatly increased. As a result, the fH changes, and the horizontal synchronism can not be reproduced by the TV receiver so that a playback picture can not be obtained. Therefore, during picture search and skip scan the fH is corrected by changing the RPM of the drum so that the fH falls within the synchronous range of the TV receiver and a synchronous playback picture is obtained.

During picture search and skip scan, pin ㊷ of IC301 (AFC ON/OFF input) becomes "H" by means of the FF/REW + CUE/REV signal, and the AFC circuit is activated. First, by means of the COMP SYNC signal input to pin ⑥ of IC301, a triggered, fixed pulse width signal is output from pin ㊲ as an AFC OUT signal in place of the DRUM PHASE PWM signal. This signal enters pin ⑩ of IC304 and is integrated. Because of this, the duty change of the AFC OUT signal becomes a DC potential change and is exits from pin ⑧ of IC304. This output from pin ⑧ of IC304 is input to pin ② of IC304 by way of analog switch IC307, mixed with the drum speed error voltage at pin ③ and output to the drum motor drive circuit from pin ① of IC304, correcting the RPM of the drum.

For example, during picture search (CUE), when the video head speed is reduced relative to the tape, the sync of the COMP SYNC signal is lengthened and the AFC OUT signal duty cycle changes. Therefore, the DC voltage at pin ⑧ of IC304, (obtained by integrating the AFC OUT signal) is reduced. As a result, the RPM of the drum, and therefore of the video head, increases relative to the tape. The sync of the COMP SYNC signal is corrected by shortening, and fH correction results.

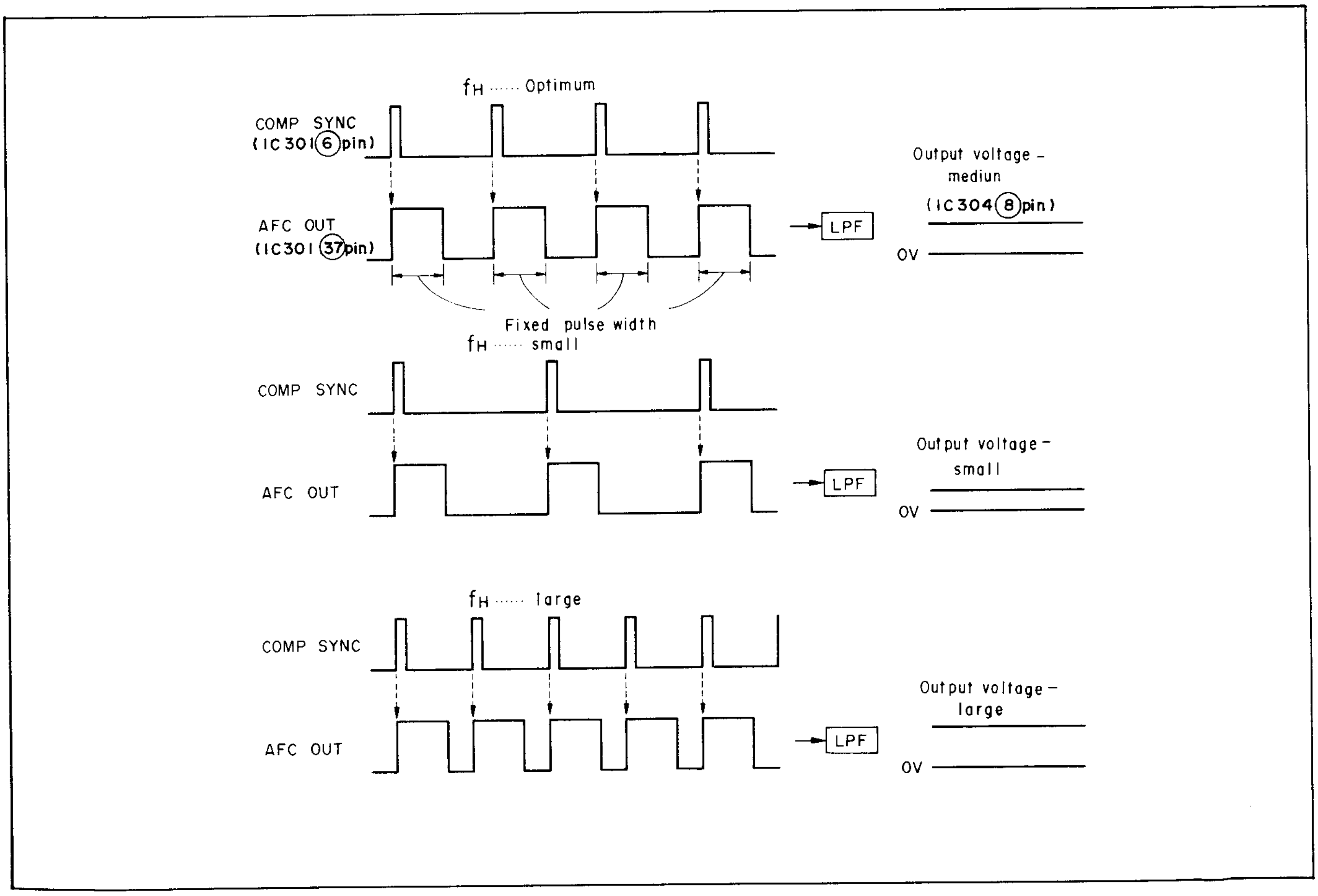

fH ······ Optimum
COMP SYNC (IC301⑥pin)
AFC OUT (IC301㊲pin)
LPF
Output voltage - mediun
(IC304⑧pin)
OV
Fixed pulse width
fH ······ small
COMP SYNC
AFC OUT
LPF
Output voltage - small
OV
fH ······ large
COMP SYNC
AFC OUT
LPF
Output voltage - large
OV

*Fig. 3-14.*

## 3-4. Capstan Motor Drive Circuit

Fig. 3-15 shows the capstan motor drive circuit. When pin (51) of IC601 (CAP STP) changes from "H" to "L", Q316 is turned off. This allows the CAP ERROR signal connected to the Q317 base to control the gain of Q319 and Q320, thereby controlling the capstan motor.

When pin (54) (CUE/REV) of IC601 changes from "L" to "H" during picture search, Q326, Q327 and Q318 are turned on, R400 is connected in parallel with R399, the base current of Q319 is increased, and the capstan motor rotates at an approximately 9 times-speed as high as that in the normal mode.

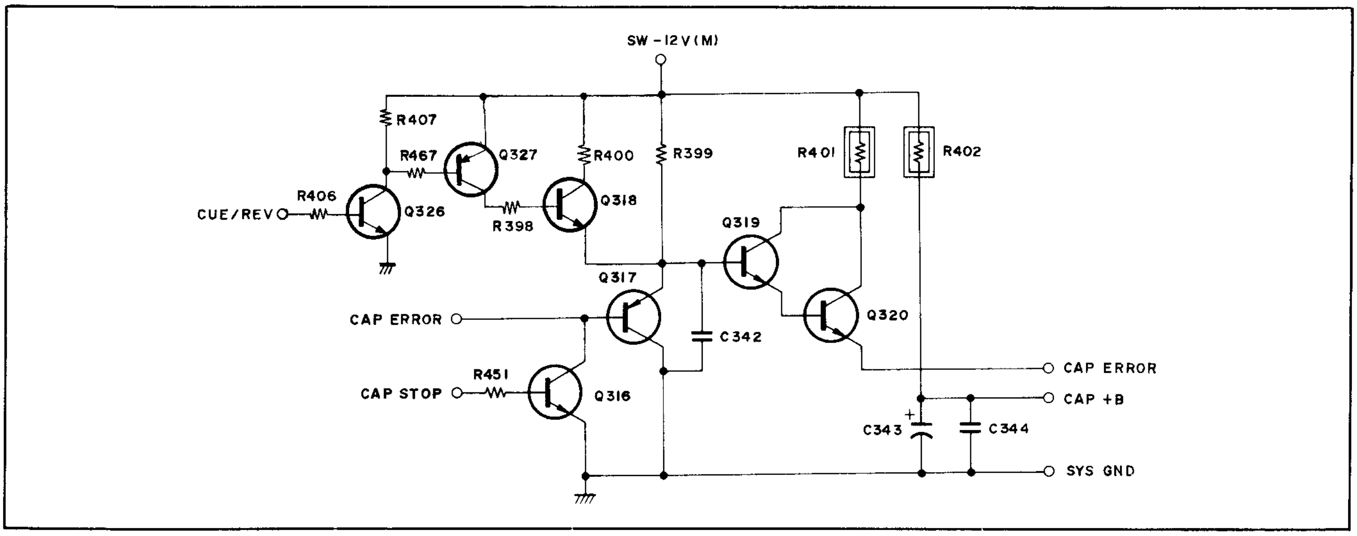

SW-12V(M)
R407
R467
Q327
R400
R399
R401
R402
R406
CUE/REV
Q326
R398
Q318
Q319
Q317
CAP ERROR
C342
Q320
R451
CAP STOP
Q316
CAP ERROR
CAP +B
C343
C344
SYS GND

*Fig. 3-15. Capstan motor drive circuit*

## 3-5. Drum Motor Drive Circuit

Fig. 3-16 shows the drum motor drive circuit. When pin ㊿ of IC601 (DRUM STP) changes from "H" to "L", Q309 is turned off. The DRUM ERROR signal drives the drum motor by means of the current amplifying circuit consisting of Q310, Q311 and Q312.

Following this, when the DRUM ERROR signal becomes "L", Q313 and Q314 are turned ON, the DRUM SERVO signal becomes "L", and the brake in the drum motor causes the motor to stop.

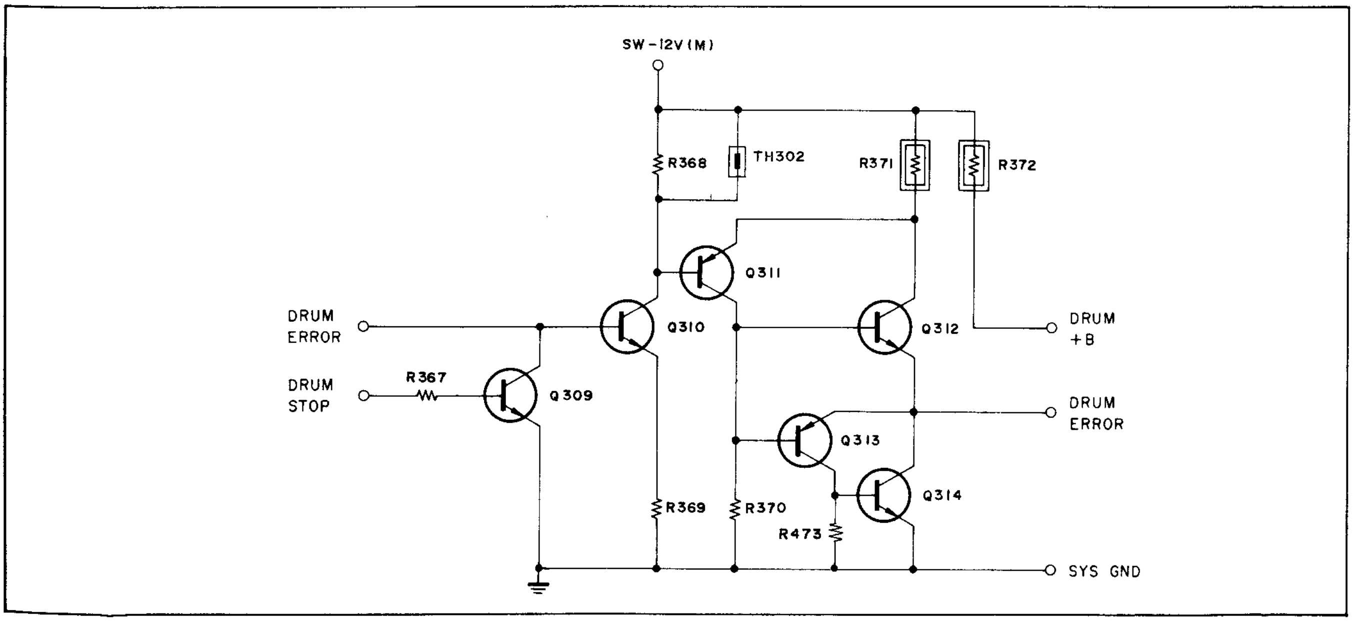

SW-12V(M)
R368
TH302
R371
R372
Q311
DRUM ERROR
Q310
Q312
DRUM +B
DRUM STOP
R367
Q309
DRUM ERROR
Q313
Q314
R369
R370
R473
SYS GND

*Fig. 3-16. Drum motor drive circuit*

## 3-6. Reel Motor Control Circuit

Fig. 3-17 shows the reel motor control circuit. The level of pin (60) (REEL STP) of IC601 is "H" during STOP operation, and Q330 and Q335 are turned on. The voltage applied to the control terminal (REEL M) of the reel motor becomes 0V, and the reel motor is stopped.

During PLAYBACK and RECORD operations, the level of pin (58) (REEL LOW) of IC601 becomes "H", and Q331 turns on. For this reason, a voltage divider (from the 12V line) consisting of the combined resistors R559/TH304/R413 and R410/RV309 provides a voltage that is applied to the Q362 base. The forward torque is adjusted using RV309. The reel motor drive AMP Q362, Q363, Q333, and Q334 is a current amplifier with a voltage gain of 1, and this voltage is applied directly to the REEL M terminal.

As a result, the reel motor rotates at a speed proportionate to the Q362 base voltage. During FAST FORWARD and REWIND operations, pin (58) (REEL LOW) of IC601 turns "L", and Q331 turns off. The level of pin (61) (FF/REW) of IC601 turns "H", and Q324, Q325 and Q368 are turned ON. A voltage divider (from the 12V line) consisting of the combined resistors R414/R559/TH304 and R492 provides a voltage to the Q362 base. As a result, the reel motor rotates at a high speed. During the REWIND mode, the level of pin (59) (REEL FWD) of IC601 turns "L", Q336 turns off, and reel motor rotates in a reverse direction.

During picture search operation, pin ㊸ (REEL CUE/REV) of IC601 goes "H", and Q365 and Q366 are turned ON. Pin (58) (REEL LOW) of IC601 goes "H" and Q033 is turned ON. In the picture search (CUE) mode, pin (59) (REEL FWD) of IC601 goes "H", Q355 is turned ON and Q359 is turned OFF. A voltage divider (from the 12V line) consisting of the combined resistors R513/R559/TH304/R413 and R410/RV309 provides a voltage that is applied to the Q362 base.

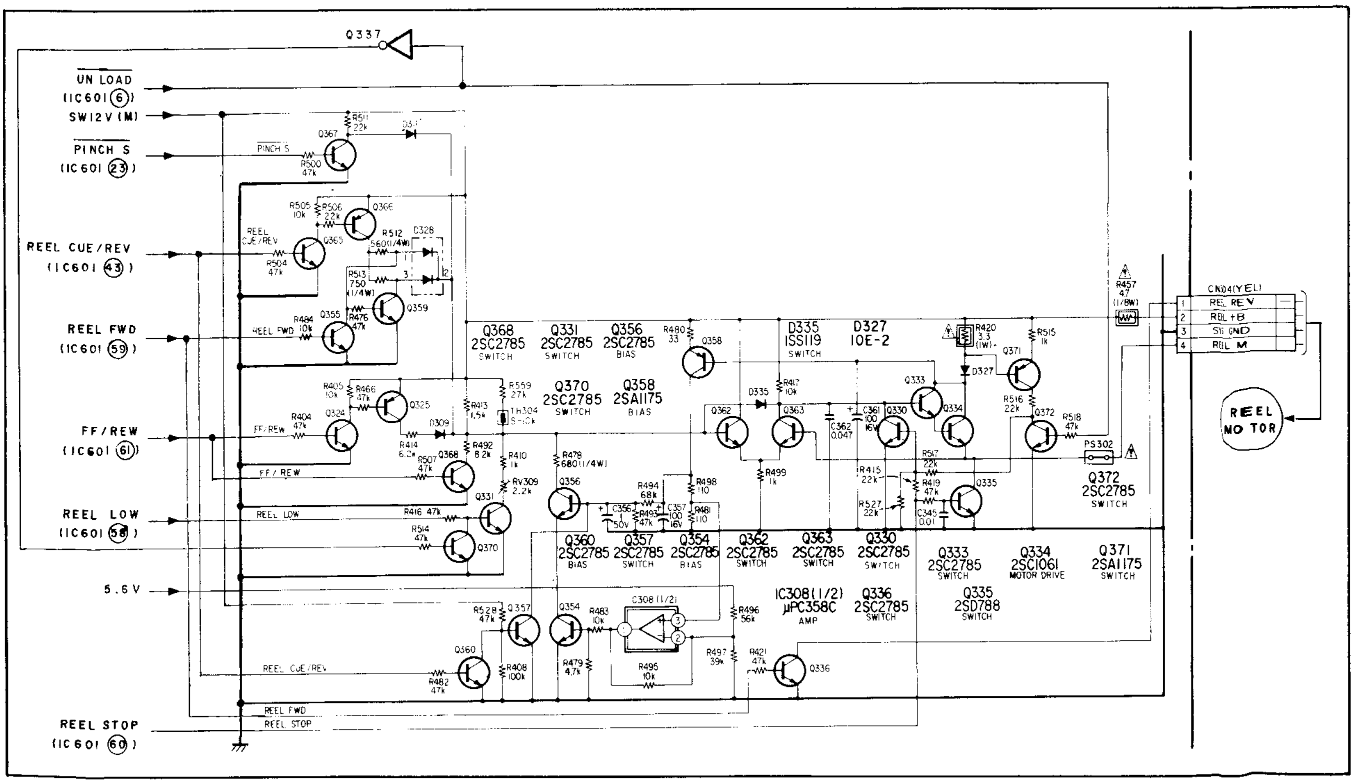
In the picture search (REV) mode, pin (59) (REEL FWD) of IC601 goes "L", Q355 is turned OFF and Q359 is turned ON. A voltage divider (from the 12V line) consisting of the combined resistors R512/R559/TH304/R413 and R410/RV309 provides a voltage that is applied to the Q362 base.

During picture search operation, currents which flow into the reel motor are held using D327, Q358, Q356, Q354 and IC308.

During skip scan (CUE and REVIEW) operations, pin (58) (REEL LOW) of IC601 goes "H" and Q331 is turned ON, in the same way as the playback mode. Pin (61) (FF/REW) of IC601 goes "H", and Q324 and Q325 are turned ON, so a voltage divider (from the 12V line) consisting of the combined resistors R414/R559/TH304/R413 and R410/RV309/R492 provides a voltage that is applied to the Q362 base. As a result, the reel motor rotates at a faster speed than that in the playback mode.

During skip scan (REVIEW) operation, pin (59) (REEL FWD) of IC601 goes "L", Q336 is turned OFF, and the reel motor rotates in reverse.

During unthreading operation, pin (61) (FF/REW) of IC601 goes "H" by 200 ms, and pin (58) (REEL LOW) of IC601 goes "H" at the same time. Pin (59) (REEL FWD) of IC601 is "L", so the reel motor rotates in reverse at the same voltage as that in the skip scan (REVIEW) mode. Then, pin (61) (FF/REW) of IC601 goes "L" and pin ⑥ (UNLOAD) Of IC601 goes "L". As a result, Q370 is turned ON, Q331 is turned OFF, and a voltage from the 12V line is applied to the Q362 base. Since Q372 is turned OFF, however, the maximum currents which flow into the reel motor are limited using Q371 and Q330 to hold the reel motor torque during UNTHREADING operation.



Q337
UN LOAD (IC601 ⑥)
SW12V (M)
PINCH S (IC601 ㉓)
REEL CUE/REV (IC601 ㊸)
REEL FWD (IC601 (59))
FF/REW (IC601 (61))
REEL LOW (IC601 (58))
5.5V
REEL STOP (IC601 (60))
Q368 2SC2785 SWITCH
Q331 2SC2785 SWITCH
Q356 2SC2785 BIAS
Q370 2SC2785 SWITCH
Q358 2SA1175 BIAS
D335 1SS119 SWITCH
D327 10E-2
Q360 2SC2785 BIAS
Q357 2SC2785 SWITCH
Q354 2SC2785 BIAS
Q362 2SC2785 SWITCH
Q363 2SC2785 SWITCH
Q330 2SC2785 SWITCH
Q333 2SC2785 SWITCH
Q334 2SC1061 MOTOR DRIVE
Q371 2SA1175 SWITCH
Q372 2SC2785 SWITCH
IC308(1/2) μPC358C AMP
Q336 2SC2785 SWITCH
Q335 2SD788 SWITCH
R559 27k
TH304
R413 1.5k
R492 8.2k
R410 1k
RV309 2.2k
R420 3.3 (1W)
R457 4.7 (1/8W)
PS302
CN04(YEL)
1 REEL REV
2 REEL +B
3 SIG GND
4 REEL M
REEL MOTOR

*Fig. 3-17. Reel motor control circuit*

### 3-7. Reel Rotation Detection Circuit

Q346 through Q349 and IC308 (1/2) are used to detect rotation of the reel table. A layer of alminum foil is applied to the bottom of the supply and take-up reel tables, and light is reflected back 60 times per revolution. The rotary sensor on the RD-6 and RD-7 boards emit light and receive the light reflected from the layer of alminum foil. For this reason, FG signals of a frequency proportional to the reel revolution are supplied to IC308 when the reel is rotating.

During PB, FF, picture search (CUE) and skip scan (CUE), pin ③ (TOP/$\overline{\text{END}}$) of IC601 goes "L", Q348 is turned OFF and Q346 is turned ON. Then, a power voltage is applied to D001 on the DR-7 board and FG signals of the take-up reel are supplied to IC308.

During REW, picture search (REV) and skip scan (REV), pin ③ (TOP/$\overline{\text{END}}$) of IC601 goes "H", and R347 and R349 are turned ON. Then, a power voltage is applied to D001 on the RD-6 board and FG signals of the supply reel are supplied to IC308.

The FG signals supplied to IC308 are formed into a rectangular wave, supplied to pin ⑫ (REEL FG) of IC601 and check existence of the reel revolution. When no FG signals are supplied for one second, the VTR immediately enters to the STOP mode on judgement that the reel is not rotating.

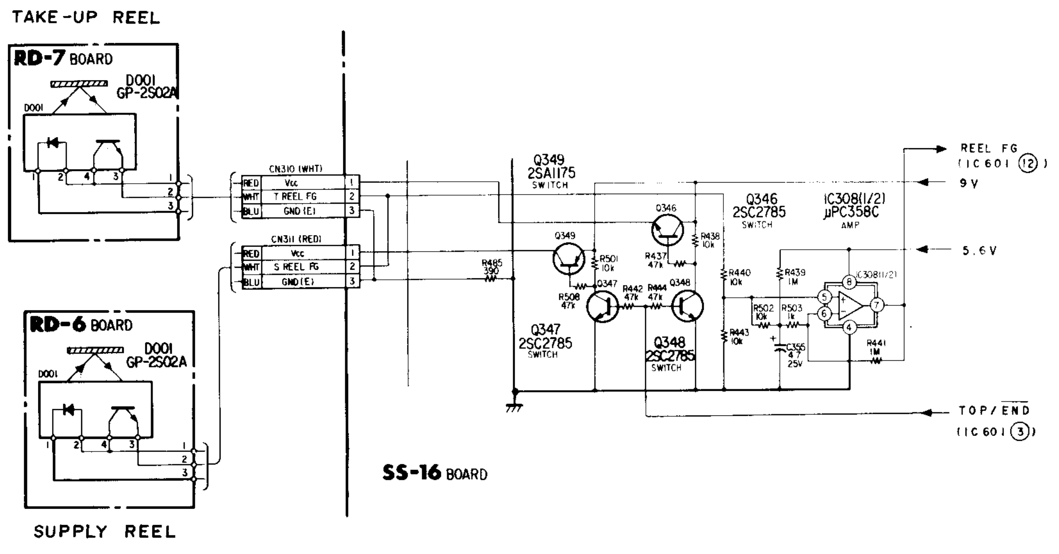

TAKE-UP REEL
RD-7 BOARD
D001
GP-2S02A
D001
RD-6 BOARD
D001
GP-2S02A
D001
SUPPLY REEL
CN310 (WHT)
RED Vcc 1
WHT T REEL FG 2
BLU GND (E) 3
CN311 (RED)
RED Vcc 1
WHT S REEL FG 2
BLU GND (E) 3
R485 390
Q349 2SA1175 SWITCH
R501 10k
R508 47k
Q347 2SC2785 SWITCH
Q346
R437 47k
R438 10k
R442 47k
R444 47k
Q348 2SC2785 SWITCH
Q346 2SC2785 SWITCH
IC308(1/2) µPC358C AMP
R440 10k
R443 10k
R439 1M
R502 10k
R503 1k
C355 4.7 25V
IC308(1/2)
R441 1M
REEL FG (IC601 ⑫)
9V
5.6V
TOP/$\overline{\text{END}}$ (IC601 ③)
SS-16 BOARD

*Fig. 3-18. Reel rotation detection circuit*

# 4. POWER SUPPLY CIRCUIT

## 4-1. SW9V and SW12V Systems

The 15V AC output of the power transformer secondary is rectified by D401 and is applied to input pin ④ of IC401. The outputs are 12V at pin ① and 9V at pin ②. The internal block diagram of IC401 is shown in Fig. 4-1.

Pin ③ of IC401 is the control terminal for output pins ① and ② and there will be outputs at pins ① and ② when pin ③ is at H level or is floating. There will be no outputs when it is at L level. In actual operation, control signals are obtained from the timer circuit through pin ⑤ of CN304 ($\overline{\text{PWR ON}}$) by ON/OFF operations of the POWER SW and control is carried out by inverter Q306.

When the POWER SW is OFF, pin ⑤ of CN304 will be at H level, Q306 will be ON, pin ③ of IC401 will be at L level and there will be no outputs at pins ① and ②. When the POWER SW is ON, conditions will be reverse to when OFF and there will be outputs at pins ① and ②.

- C414 and C415 (47/16V) are used are to prevent oscillations of IC401.
- R411 (470Ω) is a protective resistor to prevent IC401 from being destroyed by AC transient or electrostatic noises entering from pin ③ of IC401.

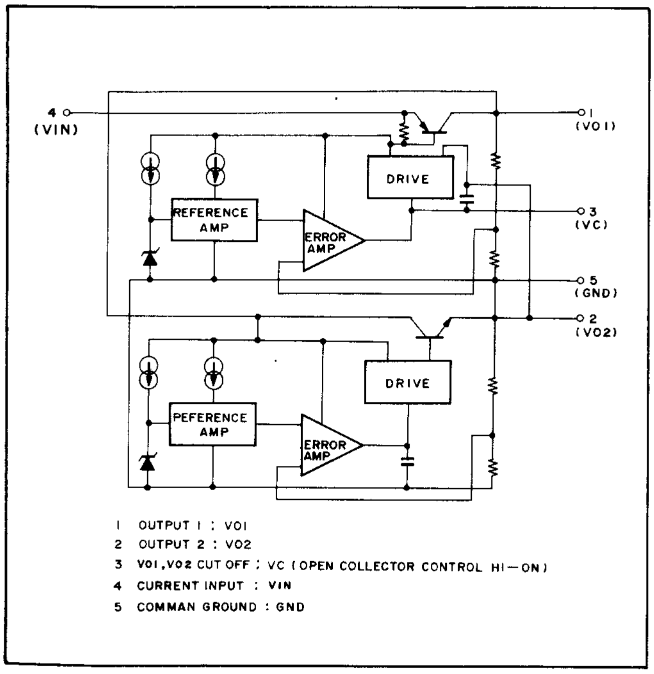


*Fig. 4-1. Block diagram of IC401 (STR-1220)*

## 4-2. SW5V System

The 7V AC output of the secondary of the power transformer is rectified by D302 and is applied to the collector of Q301 (For the regulator).

The base bias of Q301 is obtained across R304 and as one side of R304 is connected to SW9V, 5V output will not be obtained as it will be 0V in stand-by condition. As SW9V will appear when the POWER SW is turned on, bias will be applied to Q301 and 5V can be obtained from the emitter output of Q301.

Q302 and Q303 form a differential circuit for constant voltage output of Q301. The bias for Q302 is obtained from SW9V with stabilized voltage. Q303 compares the output voltage with the reference emitter voltage of Q302 and controls Q301 to obtain a stable 5V output.

## 4-3. UN +42V, −42V and −19V

- +42V and −42V are obtained by rectifying the 35V AC supply with D313 and D315.
- −19V is obtained from the −42V supply through R308 and, if a timer circuit is connected, this becomes −19V.

## 4-4. AC 3.2V

- This is taken directly from the secondary of the power transformer.

## 4-5. UN 12V and 6.2V System

- Both Q307 (for 12V) and Q308 (for 6.2V) act as regulators of the rectified output of D401 which is input through fuse F304 (T500 mA). The base bias of both Q307 and Q308 is obtained from UN +42V through R313 and R314. Stable bias current therefore flows even when the voltage drops.
- An emitter output of 6.2V is obtained with Zener Diode D317 (RD 6.8 EB2) connected to the base of Q308. D318 (RD 7.5 EB2) is used for short circuit tests between C and E of Q308 and when shorted, D318 shorts out and F304 opens.
- With reference to the 12V supply, the emitter of Q309 is connected to D317 and this is used as the reference voltage. The output voltage of Q307 is divided between R315 and R316 and is applied as the base voltage. The output voltage and reference voltage are than compared and the current resulting from the difference appears at the collector of Q309 and drives Q307.

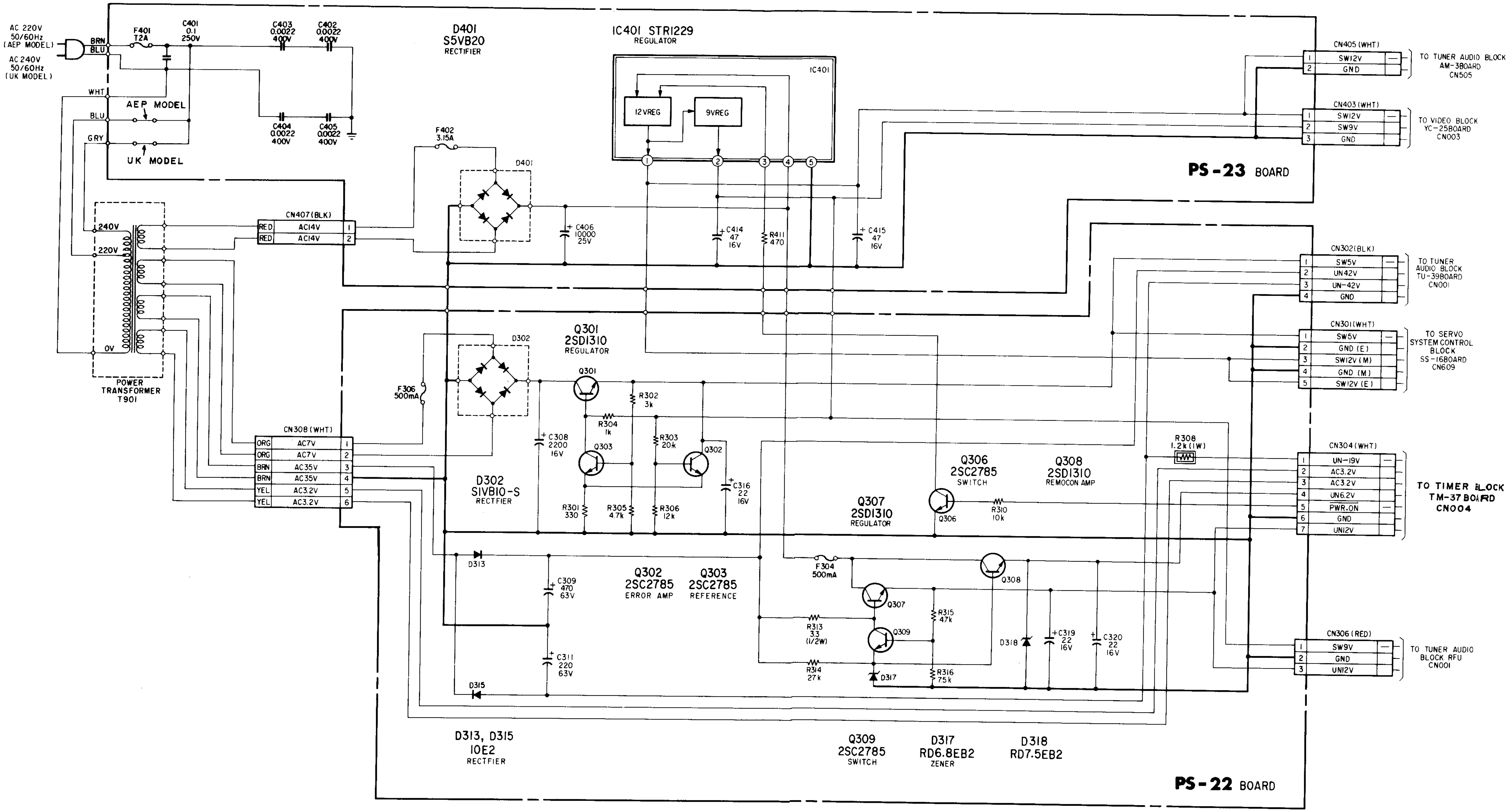

AC 220V 50/60Hz (AEP MODEL)
AC 240V 50/60Hz (UK MODEL)
BRN
BLU
WHT
BLU
GRY
F401 T2A
C401 0.1 250V
C403 0.0022 400V
C402 0.0022 400V
C404 0.0022 400V
C405 0.0022 400V
AEP MODEL
UK MODEL
D401 S5VB20 RECTIFIER
IC401 STR1229 REGULATOR
IC401
12VREG
9VREG
F402 3.15A
D401
C406 10000 25V
C414 47 16V
R411 470
C415 47 16V
PS-23 BOARD
CN405 (WHT)
1 SW12V
2 GND
TO TUNER AUDIO BLOCK AM-38BOARD CN505
CN403 (WHT)
1 SW12V
2 SW9V
3 GND
TO VIDEO BLOCK YC-25BOARD CN003
CN407 (BLK)
RED AC14V 1
RED AC14V 2
240V
220V
0V
POWER TRANSFORMER T901
CN302 (BLK)
1 SW5V
2 UN42V
3 UN-42V
4 GND
TO TUNER AUDIO BLOCK TU-39BOARD CN001
CN301 (WHT)
1 SW5V
2 GND (E)
3 SW12V (M)
4 GND (M)
5 SW12V (E)
TO SERVO SYSTEM CONTROL BLOCK SS-168OARD CN609
D302
Q301 2SD1310 REGULATOR
Q301
R302 3k
R304 1k
R303 20k
Q303
Q302
F306 500mA
C308 2200 16V
C316 22 16V
R301 330
R305 4.7k
R306 12k
D302 S1VB10-S RECTFIER
CN308 (WHT)
ORG AC7V 1
ORG AC7V 2
BRN AC35V 3
BRN AC35V 4
YEL AC3.2V 5
YEL AC3.2V 6
Q306 2SC2785 SWITCH
Q308 2SD1310 REMOCON AMP
Q307 2SD1310 REGULATOR
Q306
R310 10k
R308 1.2k (1W)
CN304 (WHT)
1 UN-19V
2 AC3.2V
3 AC3.2V
4 UN6.2V
5 PWR.ON
6 GND
7 UN12V
TO TIMER BLOCK TM-37 BOARD CN004
D313
C309 470 63V
C311 220 63V
D315
Q302 2SC2785 ERROR AMP
Q303 2SC2785 REFERENCE
F304 500mA
Q307
Q308
R313 33 (1/2W)
R314 27k
Q309
R315 47k
R316 75k
D317
D318
C319 22 16V
C320 22 16V
CN306 (RED)
1 SW9V
2 GND
3 UN12V
TO TUNER AUDIO BLOCK RFU CN001
D313, D315 10E2 RECTFIER
Q309 2SC2785 SWITCH
D317 RD6.8EB2 ZENER
D318 RD7.5EB2
PS-22 BOARD

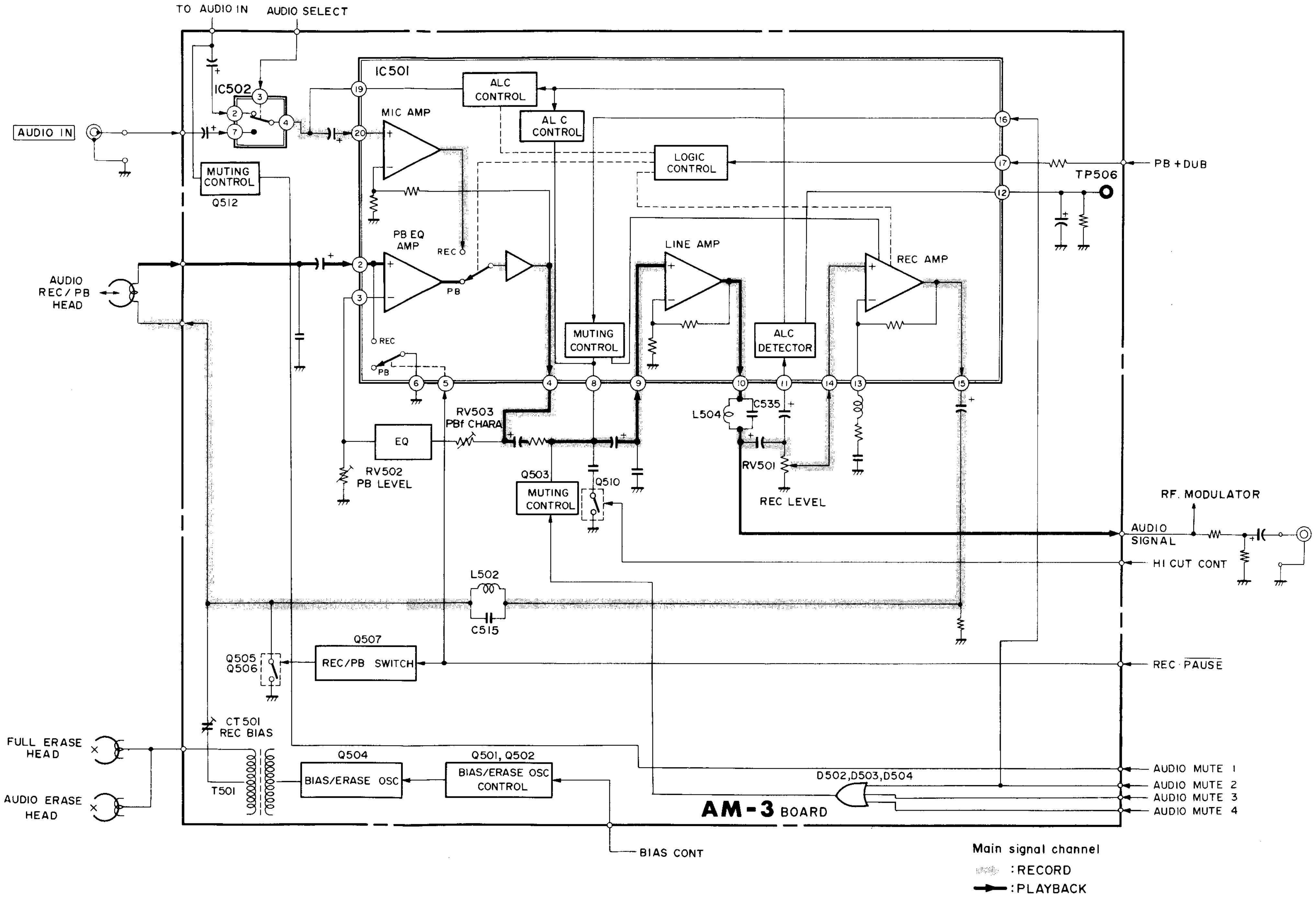
*Fig. 4-2. Circuit diagram of power supply circuit*

## 5. AUDIO CIRCUIT

The audio circuit is composed of the input selector, REC/PB amplifier, bias oscillation circuit and muting circuit mounted on the AM-3 board and a line-out output attenuator (−5 dB) on the YC-25 board.

### 5-1. Signal Flow

The signal flow in the EE, REC and PB modes is shown in Fig. 1 Block diagram and in Figs. 5-2 and 5-3 Level diagram.

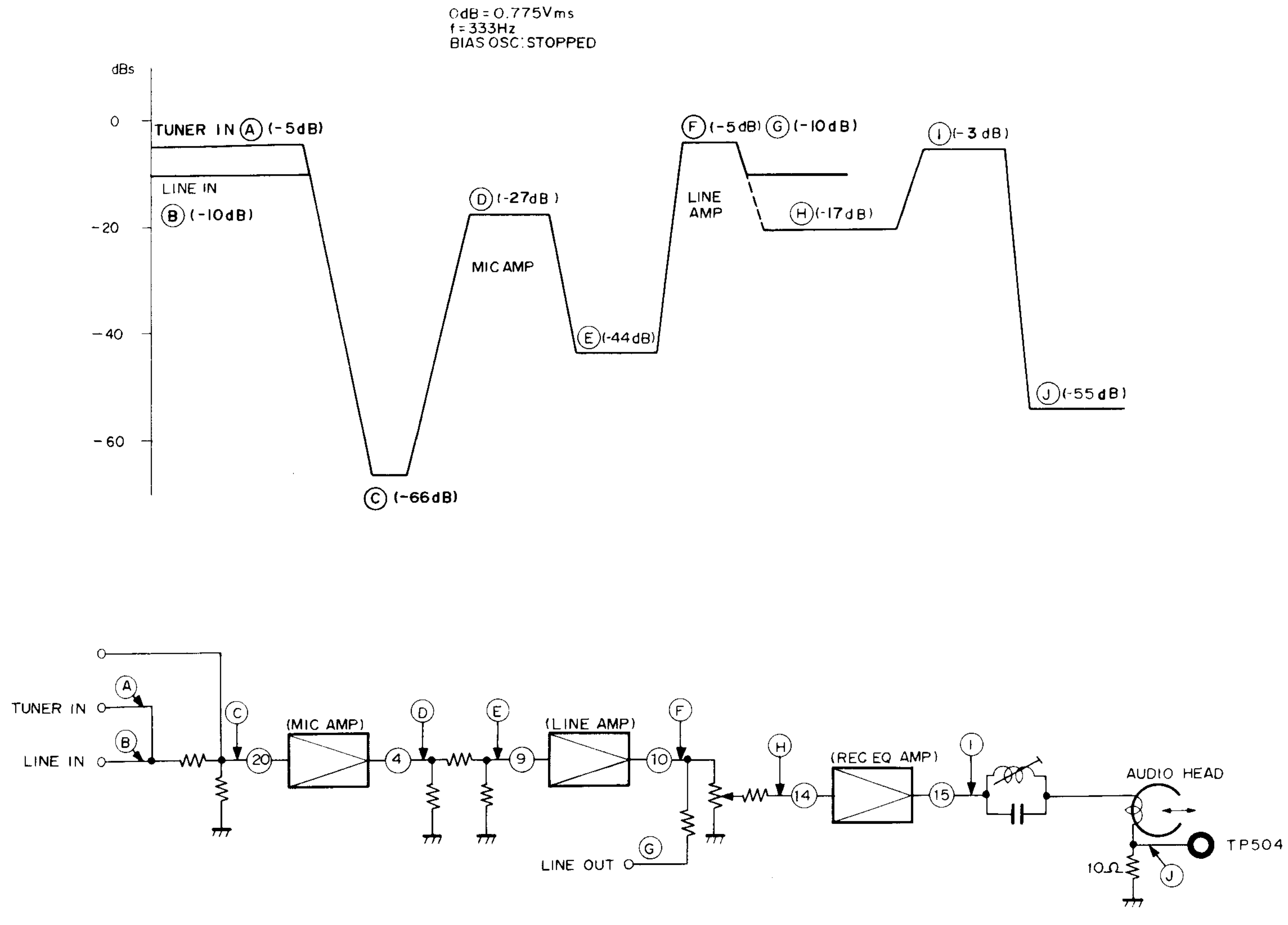


TO AUDIO IN
AUDIO SELECT
AUDIO IN
IC502
MUTING CONTROL
Q512
IC501
ALC CONTROL
AL C CONTROL
MIC AMP
LOGIC CONTROL
PB EQ AMP
REC
PB
LINE AMP
REC AMP
MUTING CONTROL
ALC DETECTOR
AUDIO REC/PB HEAD
RV503 PBf CHARA
EQ
RV502 PB LEVEL
Q503
MUTING CONTROL
Q510
L504
C535
RV501
REC LEVEL
PB + DUB
TP506
RF. MODULATOR
AUDIO SIGNAL
HI CUT CONT
L502
C515
Q507
REC/PB SWITCH
Q505
Q506
REC PAUSE
CT501 REC BIAS
FULL ERASE HEAD
AUDIO ERASE HEAD
T501
Q504
BIAS/ERASE OSC
Q501, Q502
BIAS/ERASE OSC CONTROL
D502,D503,D504
AM-3 BOARD
AUDIO MUTE 1
AUDIO MUTE 2
AUDIO MUTE 3
AUDIO MUTE 4
BIAS CONT
Main signal channel
:RECORD
:PLAYBACK

*Fig. 5-1. Block diagram of the audio section*

## AUDIO LEVEL DIAGRAM (REC)

REC MODE

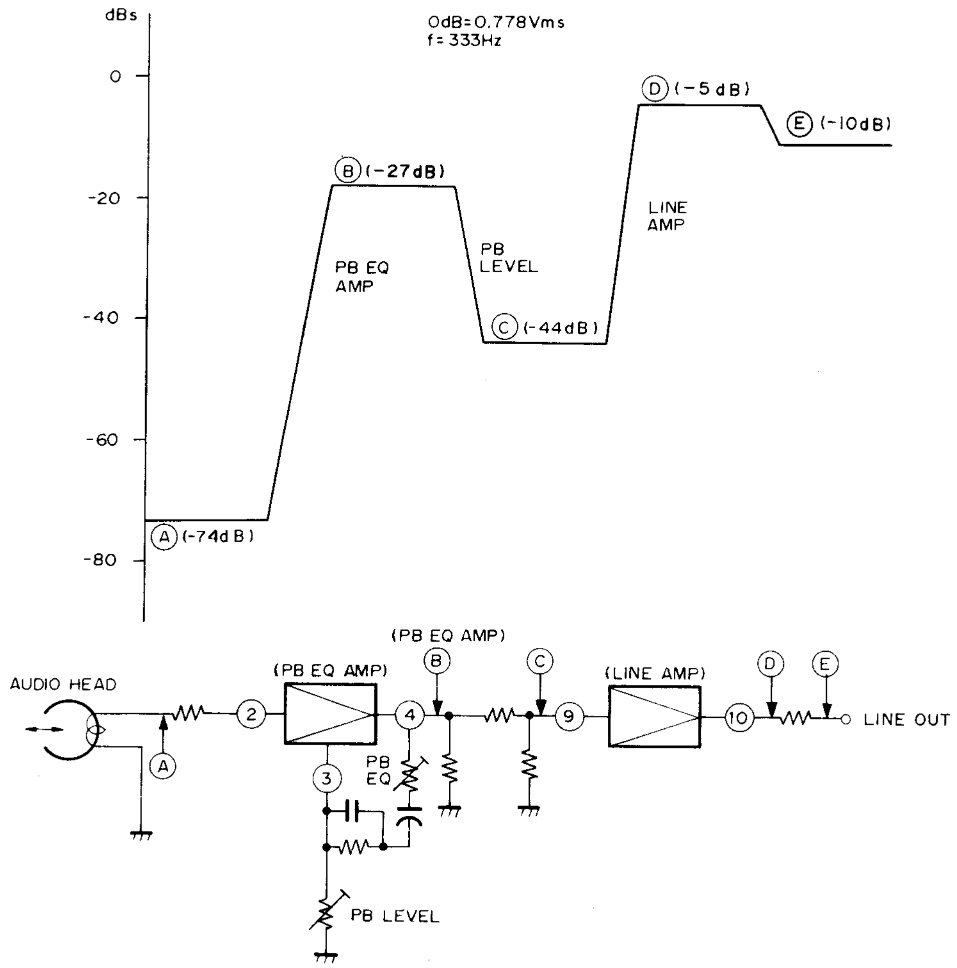


0dB = 0.775Vms
f = 333Hz
BIAS OSC: STOPPED
dBs
0
-20
-40
-60
TUNER IN Ⓐ (-5dB)
LINE IN
Ⓑ (-10dB)
Ⓒ (-66dB)
Ⓓ (-27dB)
MIC AMP
Ⓔ (-44dB)
Ⓕ (-5dB) Ⓖ (-10dB)
LINE AMP
Ⓗ (-17dB)
Ⓘ (-3dB)
Ⓙ (-55dB)
TUNER IN
LINE IN
Ⓐ
Ⓑ
Ⓒ
(MIC AMP)
20
4
Ⓓ
Ⓔ
9
(LINE AMP)
10
Ⓕ
Ⓖ
LINE OUT
Ⓗ
14
(REC EQ AMP)
15
Ⓘ
AUDIO HEAD
TP504
10Ω
Ⓙ

*Fig. 5-2.*

## AUDIO LEVEL DIAGRAM (PB)

PB MODE



dBs
0
-20
-40
-60
-80
0dB = 0.778Vms
f = 333Hz
Ⓐ (-74dB)
Ⓑ (-27dB)
PB EQ AMP
PB LEVEL
Ⓒ (-44dB)
LINE AMP
Ⓓ (-5dB)
Ⓔ (-10dB)
AUDIO HEAD
Ⓐ
2
(PB EQ AMP)
3
(PB EQ AMP)
4
Ⓑ
PB EQ
Ⓒ
9
(LINE AMP)
10
Ⓓ
Ⓔ
LINE OUT
PB LEVEL

*Fig. 5-3.*

## 5-2. Input Selector

The input selector is shown in Fig. 4. The line input is selected when the control input AUDIO SELECT signal is "L" and the tuner input is selected when it is "H". The signal level remains unchanged even after passing through IC502.

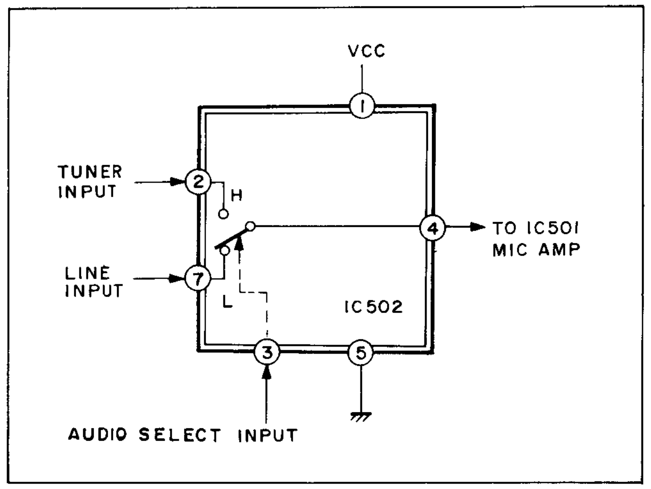

VCC
①
TUNER INPUT
②
H
④
TO IC501 MIC AMP
LINE INPUT
⑦
L
IC502
③
⑤
AUDIO SELECT INPUT

*Fig. 5-4. Input selector*

## 5-3. Recording Channel

The audio signal selected with the input selector is input to pin ⑳ of IC501 after applying AGC and is amplified in the microphone amplifier. The signal then passes through the REC/PB select switch controlled by the voltage on pin ⑰ (PB when pin ⑰ is "H" and REC when "L") and is output from pin ④ after being amplified again. After the output from pin ④ has been attenuated, AGC is again applied (AGC is in 2 stages) and the signal input to the line amp from pin ⑨. The signal amplified in the line amp and output from pin ⑩ passes through the bias filter trap formed of L504 and C535. It is then output to the line-out and the RF modulator as EE OUT. The signal output from pin ⑩ also enters pin ⑪ as an AGC input and is also input to pin ⑭ (recording equalizer amp) after passing through RV501 (recording level adjusting). The signal inputs to pin ⑭ are output from pin ⑮ as audio recording signals. This audio signal passes through the bias trap circuit formed by L502 and C515 and is supplied to the recording head after recording bias is applied.

## 5-4. Playback Channel

The audio signals reproduced in the playback head enter pin ② of IC501 and pass through the playback equalizer amp. formed of the amplifier circuit in the IC, and is output from pin ④ after passing through the REC/PB changeover switch (already explained in the Recording Circuit section) where it is amplified again. When being amplified in the playback equalizer, the playback frequency characteristics in RV502 are adjusted to playback level by RV502. Subsequent circuits are the same as those for recording with ultimate line-out to the RF modulator.

## 5-5. REC/PB Head Selector

A circuit diagram of the recording/playback head selector is shown in Fig. 5-5. When control signal REC • $\overline{\text{PAUSE}}$ from System Control is "H", the internal switch of IC501 is set to REC causing the equalizer side (at pin ② of IC501) to be grounded and Q505 and Q506 to open. As a result, the recording audio signal passes through the trap and is supplied to the recording head. When the control signal REC • $\overline{\text{PAUSE}}$ is "L", the internal switch in IC501 will be set to PB and Q505 and Q506 will be shorted-circuit. As a result, the audio signals from the recording head will be fed to the playback equalizer amp.

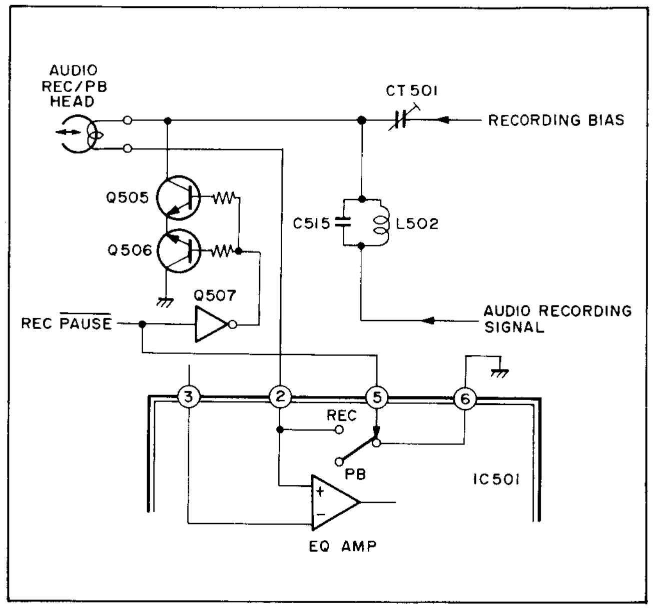

AUDIO REC/PB HEAD
CT501
RECORDING BIAS
Q505
Q506
C515
L502
Q507
REC PAUSE
AUDIO RECORDING SIGNAL
③
②
⑤
⑥
REC
PB
IC501
EQ AMP

*Fig. 5-5. REC/PB head selector*

## 5-6. Bias Oscillation Circuit

Fig. 5-6 shows a bias oscillation circuit. If a bias control signal is applied to the base of Q502, both Q501 and Q502 will go ON and the bias oscillation circuit will function. If TP510 is grounded when Q504 is oscillating, the oscillations will stop.

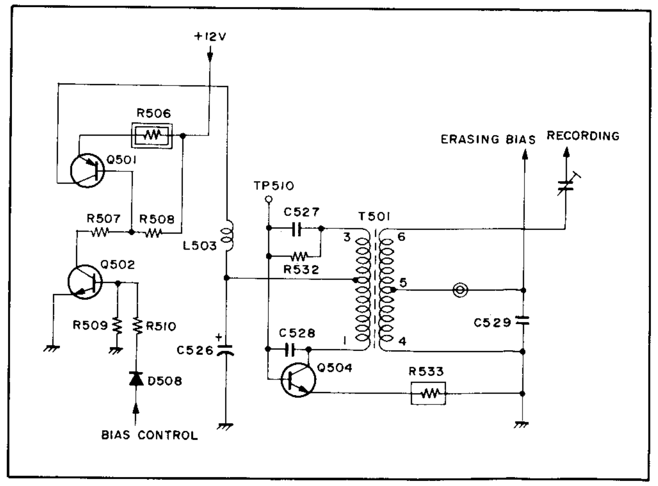

+12V
R506
Q501
R507
R508
Q502
R509
R510
D508
BIAS CONTROL
L503
C526
TP510
C527
R532
T501
3
6
5
1
4
C528
Q504
R533
C529
ERASING BIAS
RECORDING

*Fig. 5-6. Bias oscillation circuit*

## 5-7. Muting Circuit

Fig. 5-7 shows a circuit diagram of the muting circuit. There are 4 input modes for the muting control signals with the following types of control signals being sent.

A. Mute 1: This is a muting signal from the tuner which is sent for about 150 msec during channel switching to remove noise during change over.

A. Mute 2: Muting signal from system control
These are audio muting signals such as CUE/REV. (Refer to the system control timing chart in Fig. 5-8.)

A. Mute 3: This is a muting signal from the timer and is a muting signal sent during ON/OFF operation of the power supply to remove shock noises.

A. Mute 4: This is a muting signal from the video circuit which mutes audio if the picture does not appear due to a shift in the tuner.
(For SL-C30E, control signals are not output from the YC-25 board.)

The muting circuit controlled by pin ⑯ of IC501 carries out muting of the line amp only when PB control of pin ⑰ is "H" and mutes the recording amp only when "L".

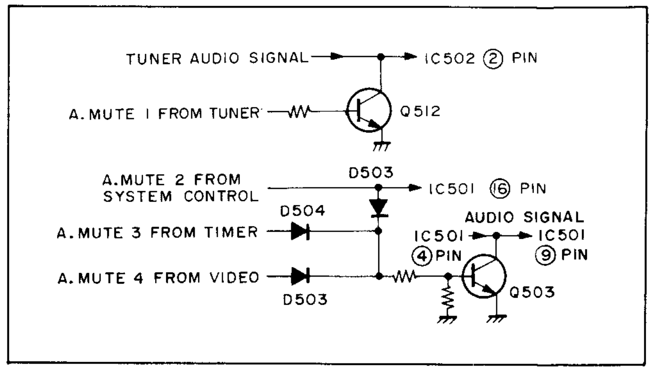

TUNER AUDIO SIGNAL
IC502 ② PIN
A. MUTE 1 FROM TUNER
Q512
A. MUTE 2 FROM SYSTEM CONTROL
D503
IC501 ⑯ PIN
D504
A. MUTE 3 FROM TIMER
AUDIO SIGNAL
IC501 ④PIN
IC501 ⑨PIN
A. MUTE 4 FROM VIDEO
D503
Q503

*Fig. 5-7. Muting circuit*

## 5-8. AGC Circuit

AGC is input from pin ⑪ of IC501 and is in 2 stages to control the input of the microphone amplifier and the input of the line amplifier. The AGC circuit functions in the REC and EE modes but does not function in the PB mode. The AGC circuit will be inactivated if TP506 is grounded.

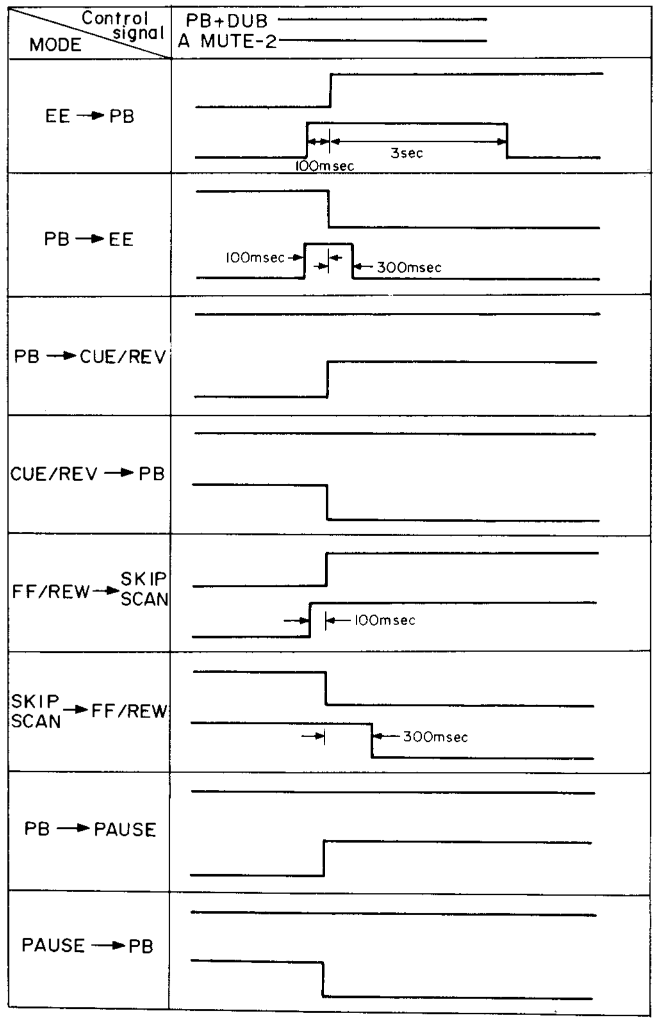


*Fig. 5-8. Muting control timing chart of system control*

## 6. TIMER BLOCK

The timer circuit is configured of TM-37, TM-38 and TM-39 boards. The fluorescent character display tubes, LEDs and some of the operating switches are mounted on TM-38 board, the control LSI and peripheral circuits on TM-37 board and most of the operating switches are provided on TM-39 board.

### 6-1. Power Supply Control Operation

(ON/OFF Operation of the power when the VTR is in "STOP" condition.)
When the ON/STANDBY button is pushed and pin ⑲ (Power SW) of IC001 becomes "L", the output of pin ⑬ (Power ON) of IC001 changes immediately and the power supply is turned ON and OFF.

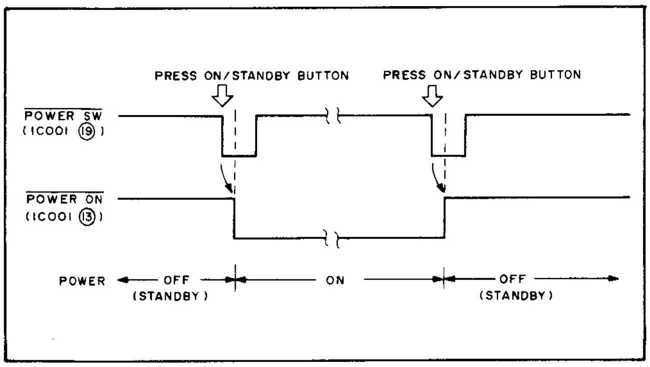

PRESS ON/STANDBY BUTTON
PRESS ON/STANDBY BUTTON
POWER SW
(IC001 ⑲)
POWER ON
(IC001 ⑬)
POWER
OFF
(STANDBY)
ON
OFF
(STANDBY)

*Fig. 6-1.*

(OFF Operation of the power when the VTR is in operating condition.)
When the ON/STANDBY button is depressed during VTR operation and pin ⑲ (Power SW) of IC001 becomes "L", RTSD signals are output from pin ⑩ of IC001 and POWER OFF codes are sent to the system control circuit. After stopping the VTR, STOP codes are output to pin ⑪ of IC001 by means of SSD signals in the system control circuit to notify IC001 that the VTR has stopped. When IC001 receives the STOP code, pin ⑬ (Power ON) of IC001 goes to "H" and turns off the power. Although RTSD signals will be output from IC001 even when turning the power off from a STOP condition, since IC001 has already received the STOP code, it will immediately switch off the power supply.

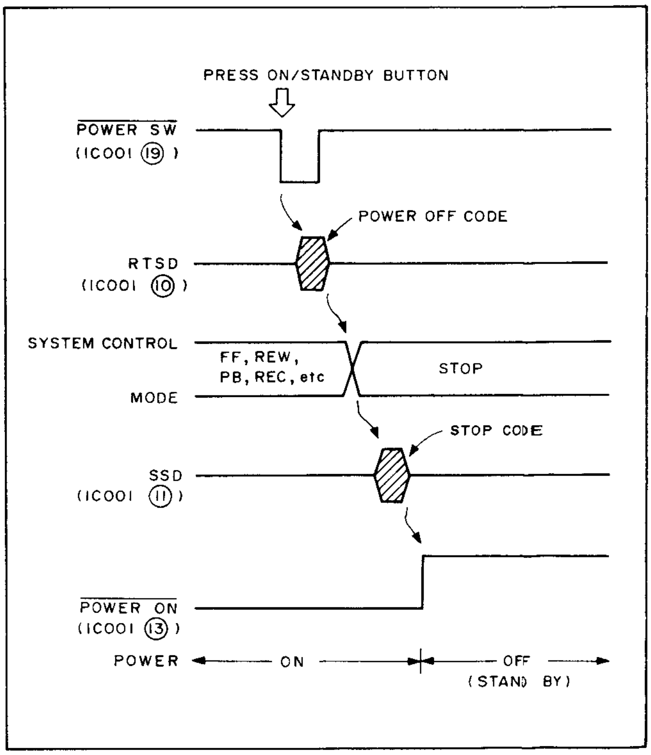
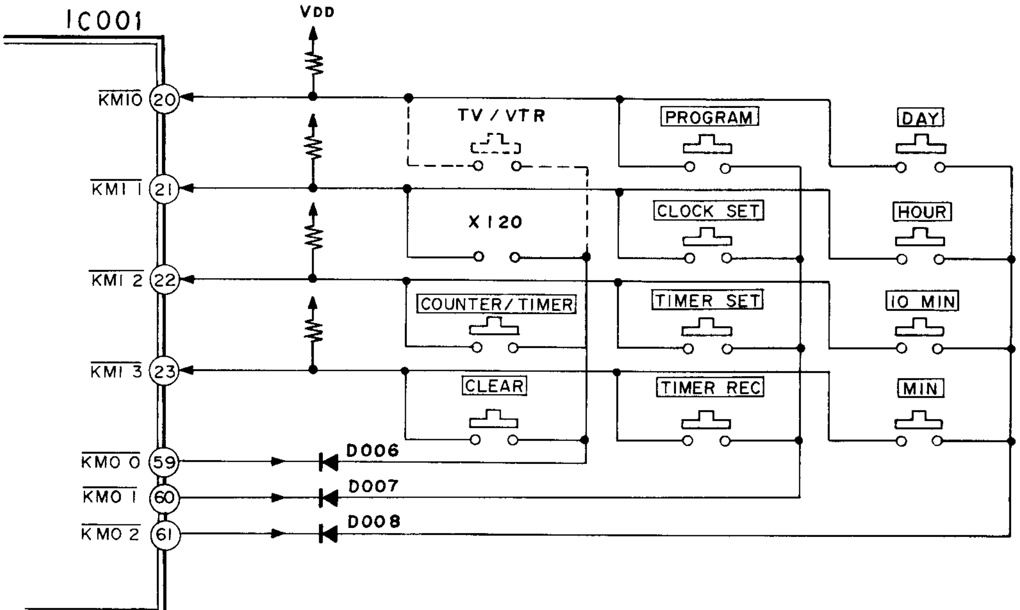

PRESS ON/STANDBY BUTTON
POWER SW
(IC001 ⑲)
POWER OFF CODE
RTSD
(IC001 ⑩)
SYSTEM CONTROL
MODE
FF, REW,
PB, REC, etc
STOP
STOP CODE
SSD
(IC001 ⑪)
POWER ON
(IC001 ⑬)
POWER
ON
OFF
(STAND BY)

*Fig. 6-2.*

(ON/OFF Operation of the power supply by remote control)
Remote control ON/OFF operation of the power supply is carried out by ON/STANDBY codes sent by IR signals input from the infrared ray receiving section instead of by Power SW signal inputs of pin ⑲ of IC001. Subsequent operations are the same as those when the ON/STANDBY button is depressed.

## 6-2. Key Matrix Input

IC001 determines which key (button) was pressed by means of matrix scanning with KMO 0 to KMO 2 outputs and KMI 0 to KMI 3 inputs. Furthermore, it is programmed so IC001 will not accept key matrix inputs if 2 or more buttons are pressed. Key matrix outputs KMO 0 to KMO 2 are not outputting regularly but commence scanning only when one of the keys is depressed. D006 to D008 prevents shorts between the output ports when two keys are pressed at the same time.


IC001
VDD
KMI0 20
KMI 1 21
KMI 2 22
KMI 3 23
KMO 0 59
KMO 1 60
KMO 2 61
TV / VTR
X 120
COUNTER/TIMER
CLEAR
PROGRAM
CLOCK SET
TIMER SET
TIMER REC
DAY
HOUR
10 MIN
MIN
D006
D007
D008

Note: The SL-C30 series do not use the TV/VTR switch.

*Fig. 6-3.*

## 6-3. Tuner Control by the Timer IC

### 1. Up-down reset and lock of the program

Selection (direct selection system) by the remote commander (accessory) and selection (during timer video recording) by the timer are carried out as follows. When selecting program N, timer IC001 first outputs PR Reset pulses from pin ① then resets selection IC IC003 of the tuner circuit in program 1. It then outputs N-1 number of PR UP pulses from pin ②. With this action, IC003 selects program N. (See Fig. 6-5.)

Also, if the UP/DOWN selection system commander such as the TT-F1E (SL-F1E) commander or the uni-commander for both TV and VTR is used, selection will be carried out using the PR UP signal and the PR DOWN signal instead of the PR RESET signal.

As the PR lock signal is a signal to inhibit acceptance of selection keys from the main unit, selection by the main unit key is inhibited as the signal becomes "L" during timer setting, timing standby, timer receiving and receiving.

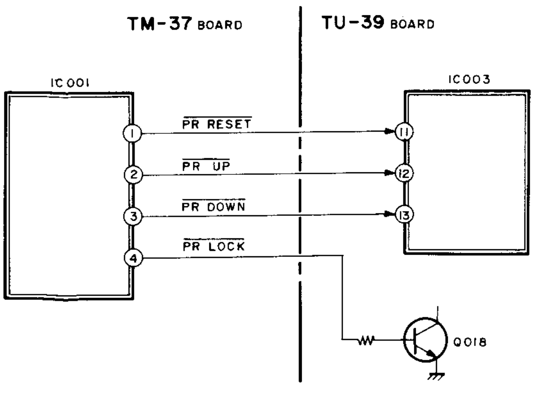

TM-37 BOARD
TU-39 BOARD
IC001
IC003
PR RESET
PR UP
PR DOWN
PR LOCK
1
2
3
4
11
12
13
Q018

*Fig. 6-4.*

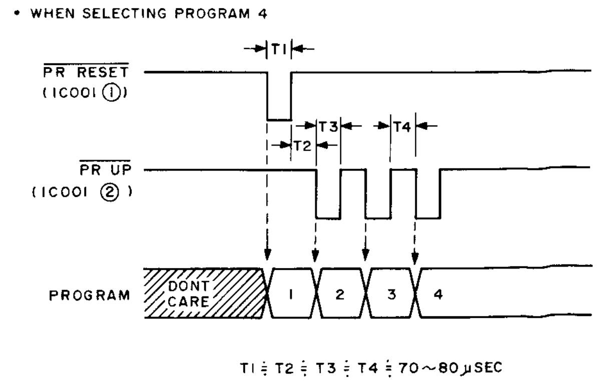


*Fig. 6-5.*

## 6-4. Channel Data Interface

Although segment signals a, b, c, d, e, f, g, and h are output from selection IC IC003 of the tuner, c and d segment signals are not used as they are not required for judging read in with timer command IC001.

Segment signal a to g : Used for displaying the 1 digit
Segment signal h : Used for displaying the 10 digit

When h is "L", the digit "10" will be blanked and when "H", the digit "1" will be displayed.

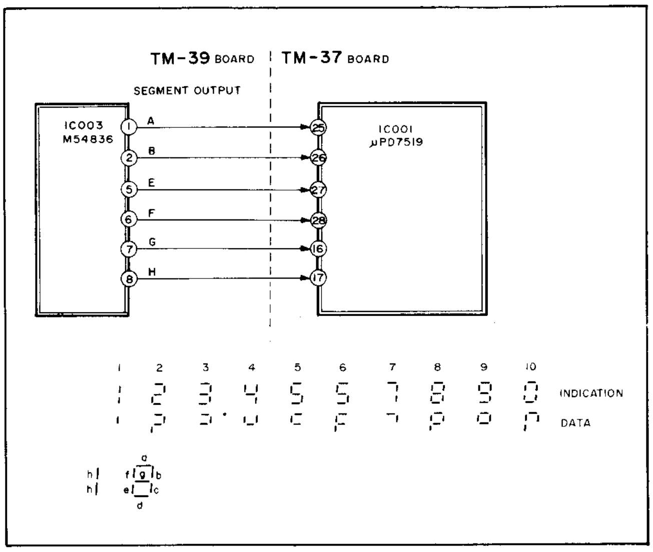

TM-39 BOARD
TM-37 BOARD
SEGMENT OUTPUT
IC003
M54836
IC001
μPD7519
A
B
E
F
G
H
1
2
5
6
7
8
25
26
27
28
16
17
1 2 3 4 5 6 7 8 9 10
INDICATION
DATA
h
h
a
f
g
b
e
c
d

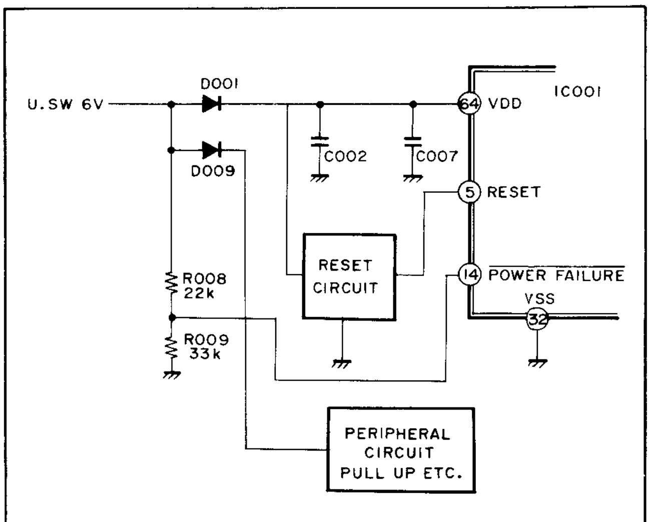
*Fig. 6-6.*

## 6-5. Power Failure Backup Circuit

Memories in relation to the timer clock function, timer settings, counter readings, and power ON/OFF conditions are protected by C002 (0.047F/5.5V electrical double layer capacitor) in the event of a power failure.

Power is normally supplied to microcomputer IC001 from an unswitched 6V power source through D001 with C002 being charged at the same time. A voltage of approximately 3.6V appears at pin ⑭ of IC001 at this time (The microcomputer judges this to be "H" level.). If a power failure occurs here, D001 will cut off as the unswitched 6V will drop to "0" and power will be supplied to the microcomputer from the charge stored in C002. To extend backup time during a power failure, the operating mode of the microcomputer is switched to a slow speed mode and all output ports are set to "L" level to prevent outflow of current from the ports of the peripheral circuits.

Detection of a power failure is carried out by pin ⑭ and, when the unswitched 6V drops below about 4V, it goes into the power failure mode. Only the clock advancing function (internally) and the power restoration detection function of pin ⑭ operate during a power failure.


U.SW 6V
D001
D009
C002
C007
IC001
64
VDD
5
RESET
RESET
CIRCUIT
14
POWER FAILURE
VSS
32
R008
22k
R009
33k
PERIPHERAL
CIRCUIT
PULL UP ETC.

D001 : PREVENTS REVERSE FLOW
D009 : LEVEL SHIFT
C002 : BACKUP CAPACITOR
C007 : NOISE REMOVAL
R008 AND R009 : DIVIDING

*Fig. 6-7.*

## 6-6. Reset Circuit

Fig. 6-8 is the reset circuit and Fig. 6-9 is its equivalent circuit. Although D005 is an LED, it is used here as a constant voltage source of about 1.7 to 1.8V by using its forward voltage. In operation, reset time is secured by the time constants of R017 and C001 when switching on the power.
When the voltage gradually rises or falls, reset will be released when the voltage rises above about 4V due to hysteresis caused by R018 and R004 and reset will be locked again if the voltage drops below about 2.9V.

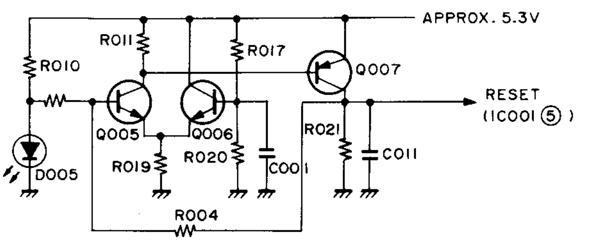

APPROX. 5.3V
R011
R017
R010
Q007
RESET
(IC001 ⑤)
Q005
Q006
R021
C011
D005
R019
R020
C001
R004

*Fig. 6-8. Reset circuit*

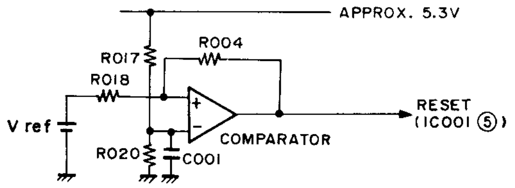

APPROX. 5.3V
R004
R017
R018
V ref
+
-
RESET
(IC001 ⑤)
COMPARATOR
R020
C001

*Fig. 6-9. Equivalent circuit*

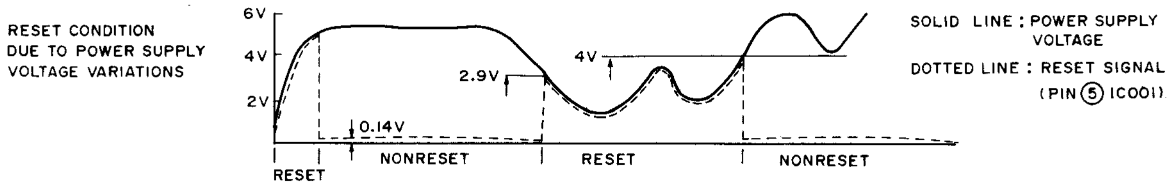


*Fig. 6-10.*

## 7. TUNER CIRCUIT

The tuner, VIF circuit, SIF circuit, AGC circuit, selection and band-change circuit and the tuner operating SW circuit configure the TU-39 board.

### 7-1. Operation of the Signal System

The broadcast waves input from the ANT IN terminal are amplified about 4 dB (when DX) in the RFU (RF Modulator mixer) and are input in RF IN of the tuner. A + B voltage (12V), band change voltage (VL, VH, U), AGC voltage and VC voltage are input to the tuner and when a certain broadcast wave is received, it is output to IF OUT.

| Receiving band / TU Terminal | I(E2 ~ E4) | III(E5 ~ E12) | U(E21 ~ E68) |
|---|---|---|---|
| +B | +12V | +12V | +12V |
| VL | +12V | +12V | <0.5V |
| VH | −12V | +12V | <0.5V |
| U | <0.5V | <0.5V | +12V |
| VC | 4 ~ 15V | 5 ~ 21V | 1 ~ 27V |
| AGC | 1 ~ 8.5V | 1 ~ 8.5V | 1 ~ 8.5V |

*Table 7-1. Relations between the TU terminal and receiving band*

The signals output from TU IF OUT contain frequency components such as the 38.9 MHz video carrier and the 33.4 MHz audio carrier. These frequencies are amplified in the preamp circuit composed of Q001, T001 and T002 and their spectrum is further shaped in the SAW filter of SF001. The signal is then input to pins ① and ⑯ of the VIF IC IC001 after matching is carried out with T003. IF signal amplification and synchronizing detection is carried out through IC001. The detector output appears at pin ⑫ and the video signal is sent to PC board YC-25 after passing through the 5.5 MHz trap (about 50 dB) of CT001. Pin ③ of IC001 is the voltage input section that determines the DELAY POINT of the RF AGC and is at about 5V. The RF AGC voltage for the tuner is output from pin ④. Pins ⑤ and ⑥ are of reverse characteristics at the AFT signal output terminal. Pins ⑧ and ⑨ are tank circuit inputs for the IF frequency (38.9 MHz) and are tuned with T004. Pins ⑦ and ⑩ are tank circuit inputs for AFT and are tuned with T005. The 5.5 MHz audio FM signal output from pin ⑫ pass through the 5.5 MHz band pass filter CF001 and enter pin ⑧ of IC002 and IC002 carries out FM audio detection. Detection is carried out by connecting a discriminator to pins ② and ③ and the output from pin ④ is fed to AM-3 board.

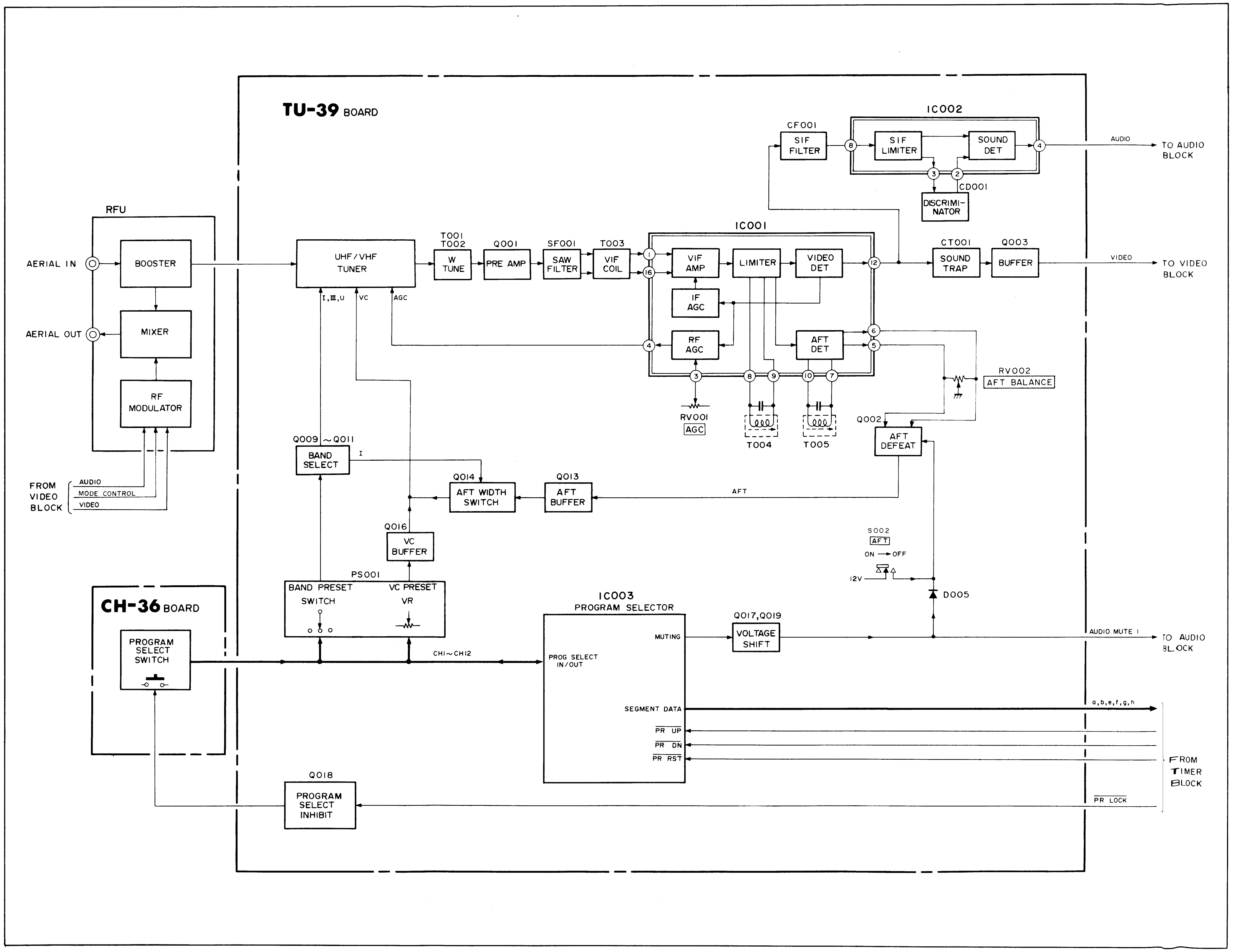

TU-39 BOARD
RFU
AERIAL IN
BOOSTER
AERIAL OUT
MIXER
RF MODULATOR
FROM VIDEO BLOCK
AUDIO
MODE CONTROL
VIDEO
UHF/VHF TUNER
I, III, U
VC
AGC
T001 T002
W TUNE
Q001
PRE AMP
SF001
SAW FILTER
T003
VIF COIL
IC001
VIF AMP
LIMITER
VIDEO DET
IF AGC
RF AGC
AFT DET
RV001
AGC
T004
T005
CF001
SIF FILTER
IC002
SIF LIMITER
SOUND DET
CD001
DISCRIMI-NATOR
AUDIO
TO AUDIO BLOCK
CT001
SOUND TRAP
Q003
BUFFER
VIDEO
TO VIDEO BLOCK
RV002
AFT BALANCE
Q002
AFT DEFEAT
Q009 ~ Q011
BAND SELECT
I
Q014
AFT WIDTH SWITCH
Q013
AFT BUFFER
AFT
Q016
VC BUFFER
PS001
BAND PRESET SWITCH
VC PRESET VR
S002
AFT
ON → OFF
12V
D005
CH-36 BOARD
PROGRAM SELECT SWITCH
CH1~CH12
IC003
PROGRAM SELECTOR
PROG SELECT IN/OUT
MUTING
SEGMENT DATA
PR UP
PR DN
PR RST
Q017, Q019
VOLTAGE SHIFT
AUDIO MUTE I
TO AUDIO BLOCK
a, b, e, f, g, h
FROM TIMER BLOCK
PR LOCK
Q018
PROGRAM SELECT INHIBIT

*Fig. 7-1. Tuner block diagram (AEP.E model)*

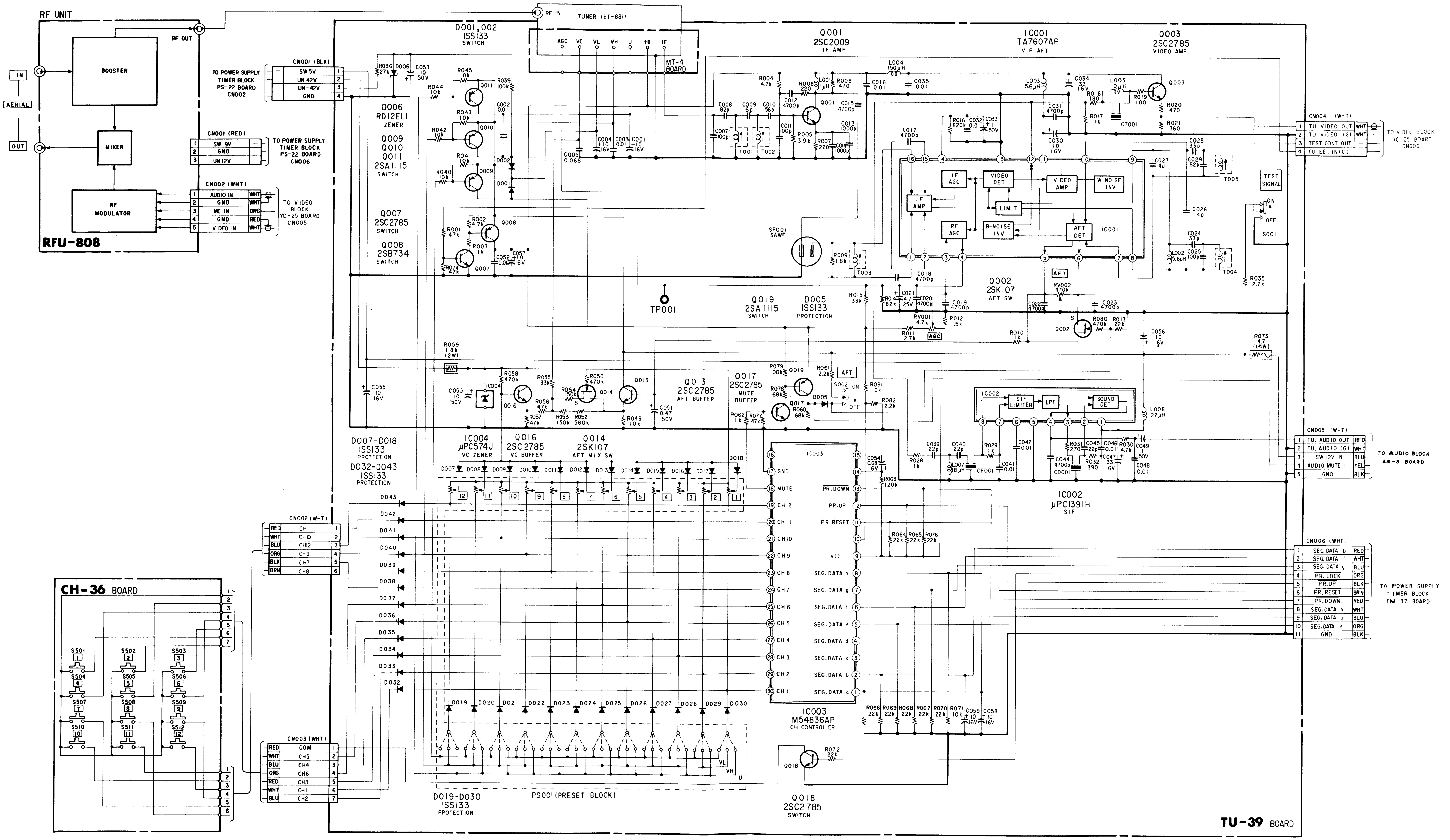
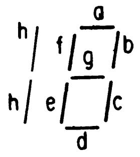

RF UNIT
BOOSTER
MIXER
RF MODULATOR
RF OUT
IN
AERIAL
OUT
RFU-808
TUNER (BT-881)
RF IN
AGC VC VL VH U +B IF
MT-4 BOARD
CN001 (BLK)
SW 5V
UN 42V
UN -42V
GND
TO POWER SUPPLY TIMER BLOCK PS-22 BOARD CN002
CN001 (RED)
SW 9V
GND
UN 12V
TO POWER SUPPLY TIMER BLOCK PS-22 BOARD CN006
CN002 (WHT)
AUDIO IN
GND
MC IN
GND
VIDEO IN
TO VIDEO BLOCK YC-25 BOARD CN005
D001,002 1SS133 SWITCH
D006 RD12EL1 ZENER
Q009 Q010 Q011 2SA1115 SWITCH
Q007 2SC2785 SWITCH
Q008 2SB734 SWITCH
Q001 2SC2009 IF AMP
IC001 TA7607AP VIF AFT
Q003 2SC2785 VIDEO AMP
IF AGC
VIDEO DET
VIDEO AMP
W-NOISE INV
IF AMP
LIMIT
RF AGC
B-NOISE INV
AFT DET
SF001 SAWF
TP001
Q019 2SA1115 SWITCH
D005 1SS133 PROTECTION
Q002 2SK107 AFT SW
AFT
AGC
TEST SIGNAL
S001 ON OFF
CN004 (WHT)
TU VIDEO OUT
TU VIDEO (G)
TEST CONT OUT
TU.EE. IN(C)
TO VIDEO BLOCK YC-25 BOARD CN006
Q013 2SC2785 AFT BUFFER
Q017 2SC2785 MUTE BUFFER
S002 ON OFF
IC004 μPC574J VC ZENER
Q016 2SC2785 VC BUFFER
Q014 2SK107 AFT MIX SW
D007-D018 1SS133 PROTECTION
D032-D043 1SS133 PROTECTION
IC002 SIF LIMITER LPF SOUND DET
IC002 μPC1391H SIF
CN005 (WHT)
TU. AUDIO OUT
TU. AUDIO (G)
SW 12V IN
AUDIO MUTE 1
GND
TO AUDIO BLOCK AM-3 BOARD
IC003
GND MUTE CH12 CH11 CH10 CH9 CH8 CH7 CH6 CH5 CH4 CH3 CH2 CH1
PR.DOWN PR.UP PR.RESET Vcc
SEG. DATA h SEG. DATA g SEG. DATA f SEG. DATA e SEG. DATA d SEG. DATA c SEG. DATA b SEG. DATA a
IC003 M54836AP CH CONTROLLER
CN006 (WHT)
SEG. DATA b
SEG. DATA f
SEG. DATA g
PR. LOCK
PR.UP
PR. RESET
PR. DOWN.
SEG. DATA h
SEG. DATA a
SEG. DATA e
GND
TO POWER SUPPLY TIMER BLOCK TM-37 BOARD
CN002 (WHT)
CH11 CH10 CH12 CH9 CH7 CH8
CN003 (WHT)
COM CH5 CH4 CH6 CH3 CH1 CH2
CH-36 BOARD
S501 S502 S503 S504 S505 S506 S507 S508 S509 S510 S511 S512
D019-D030 1SS133 PROTECTION
PS001 (PRESET BLOCK)
Q018 2SC2785 SWITCH
TU-39 BOARD

Fig. 7-2. Circuit diagram of the tuner (AEP,E model)

### 7-2. Tuning Operation

If the channel button corresponding to the 12-channel preset unit (PS001) is depressed, pins ⑲ to ㉚ of IC003 (M54863AP) will go to ground and the corresponding voltages will be supplied to the tuner VC terminal through Q016. Q009 to Q011 will be turned ON by the band select SW and the voltages shown in Table 7-1 will be applied to the tuner band terminal. Channel data output signals a, b, e, f, g, and h will be sent as segment outputs and program display will be carried out after being judged by the timer microcomputer. IC003 selections will also change due to channel UP-DOWN signals (CN006) from the timer during TIMER REC or during remote control operation. Mute signals of about 150 ms will appear at pin ⑱ of IC003 when power is turned on or when the channel is changed over. This is converted to 12V mute signals by Q017 and Q019 and is sent to AM-3 board. It also causes Q002 to function and go into AFT OFF state by offsetting the AFT voltage on pins ⑤ and ⑥ of IC001. Q002 is also set to ON condition during AFT OFF as AFT SW S002 also functions the same as mute. AFT operation is carried out during AFT ON as the DC output of pin ⑤ of IC001 is added to the VC voltage from PS001. Q014 carries out changeover of the AFT addition voltage according to the receiving band.



### 7-3. Tuner POWER Switch

Q007 and Q008 are operated by TU-EE signals from YC-25 board to supply B+ voltage to the tuner, Q001, IC001, Q003, Q017 and Q019. The tuner circuit and VIF circuit do not function during PB and Line input as TU-EE signal is low at this time.

### 7-4. Tuning Power Supply

The +42V from pin ② of CN001 is passed through a 1.8 kΩ resistor (R059) and supplied to IC004 (μPC574J), which is a 33V zener IC, to obtain VC voltage for the tuner.
−12V for the tuner is also obtained from the −42V on pin ③ of CN001 by D006 (RD12EL).

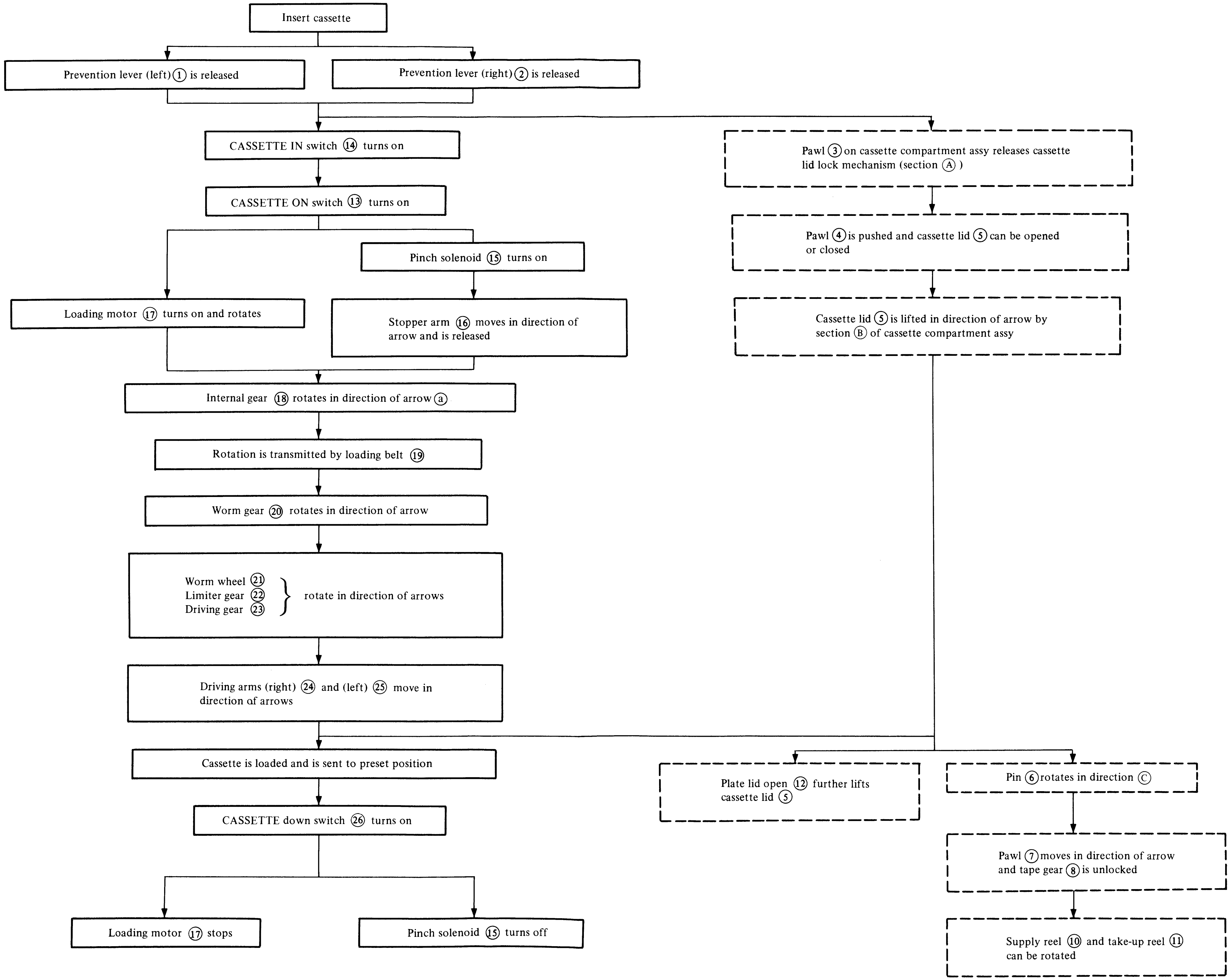
### 7-5. TEST SIG SW

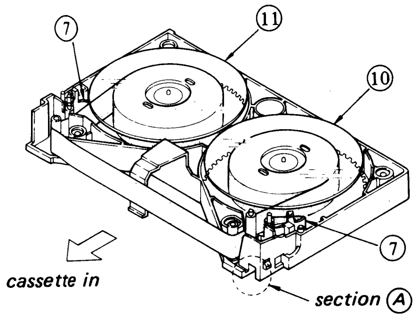
A TEST SIGNAL SW (S001) is provided in the tuner preset section. This provides a 12V supply for YC-25 board through a 2.7 kΩ resistor when ON.

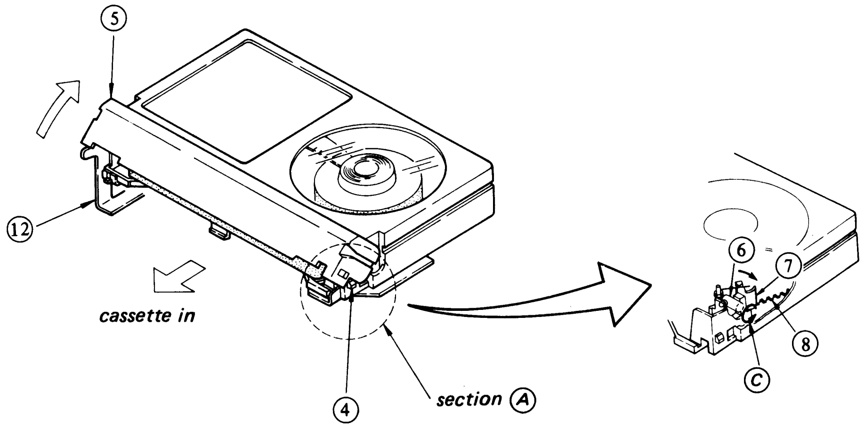
## 8. MECHANICAL OPERATION

### 8-1. CASSETTE LOADING

Steps indicated in ┌┄┄┐ are for cassette


Insert cassette
Prevention lever (left) ① is released
Prevention lever (right) ② is released
CASSETTE IN switch ⑭ turns on
CASSETTE ON switch ⑬ turns on
Pinch solenoid ⑮ turns on
Loading motor ⑰ turns on and rotates
Stopper arm ⑯ moves in direction of arrow and is released
Internal gear ⑱ rotates in direction of arrow ⓐ
Rotation is transmitted by loading belt ⑲
Worm gear ⑳ rotates in direction of arrow
Worm wheel ㉑
Limiter gear ㉒
Driving gear ㉓
rotate in direction of arrows
Driving arms (right) ㉔ and (left) ㉕ move in direction of arrows
Cassette is loaded and is sent to preset position
CASSETTE down switch ㉖ turns on
Loading motor ⑰ stops
Pinch solenoid ⑮ turns off
Pawl ③ on cassette compartment assy releases cassette lid lock mechanism (section Ⓐ )
Pawl ④ is pushed and cassette lid ⑤ can be opened or closed
Cassette lid ⑤ is lifted in direction of arrow by section Ⓑ of cassette compartment assy
Plate lid open ⑫ further lifts cassette lid ⑤
Pin ⑥ rotates in direction Ⓒ
Pawl ⑦ moves in direction of arrow and tape gear ⑧ is unlocked
Supply reel ⑩ and take-up reel ⑪ can be rotated


⑦
⑪
⑩
⑦
cassette in
section Ⓐ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cassette in
④
section Ⓐ
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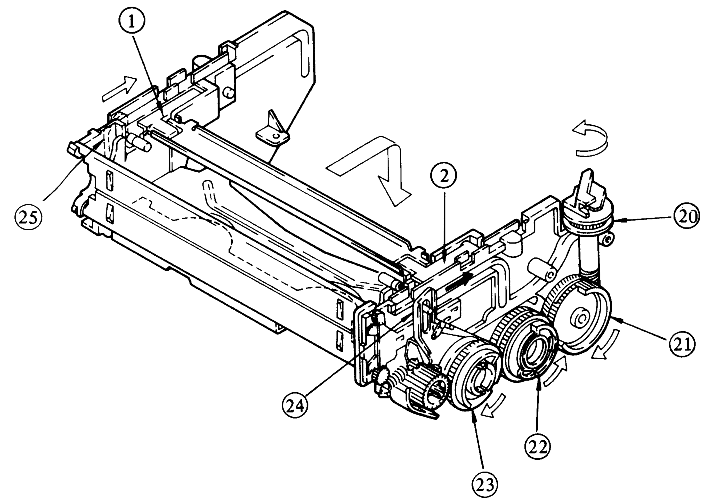
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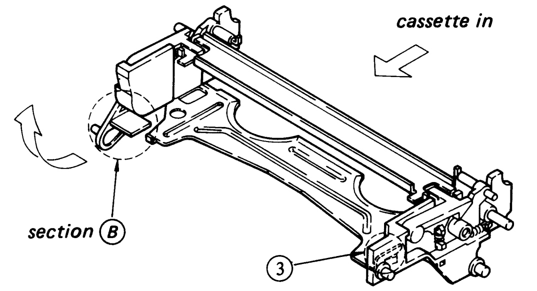
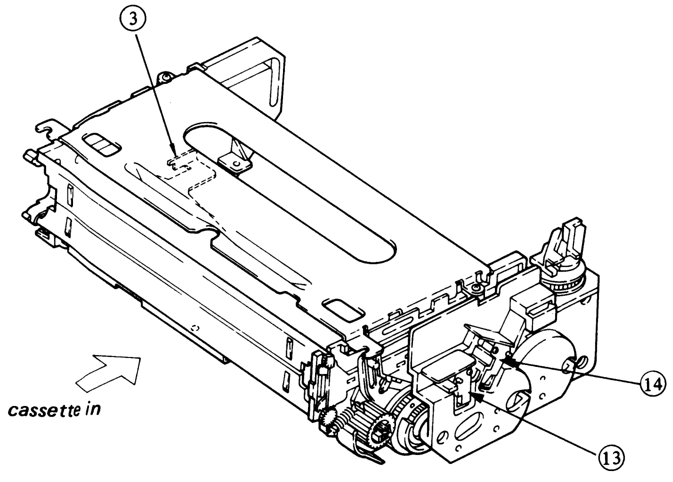
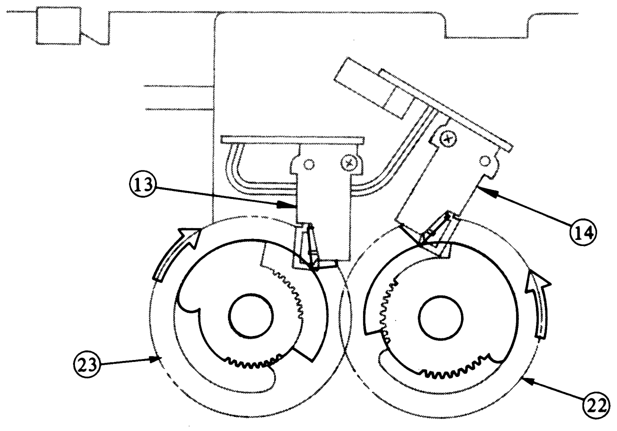

cassette in
section Ⓑ
③


③
⑭
cassette in
⑬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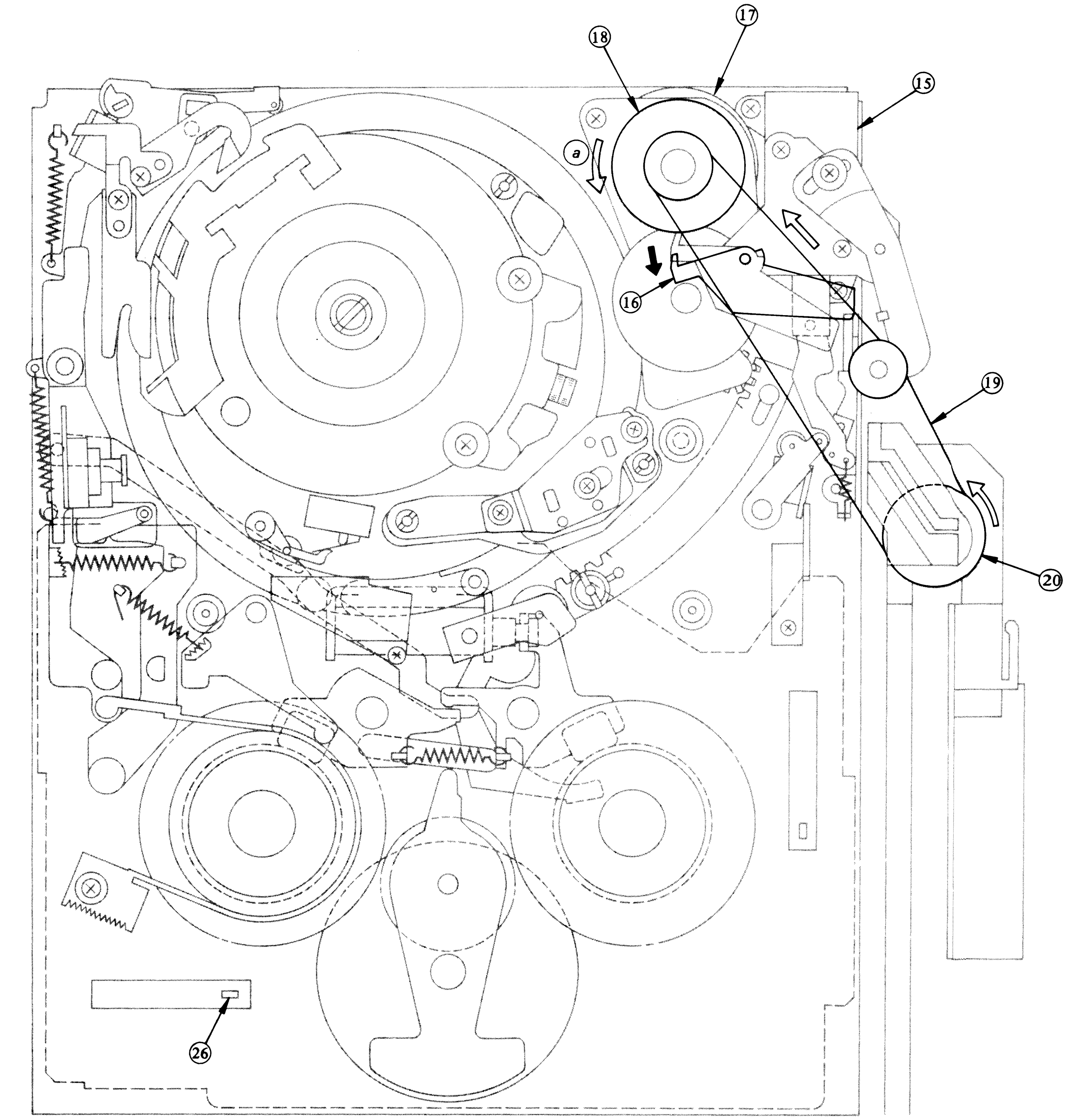
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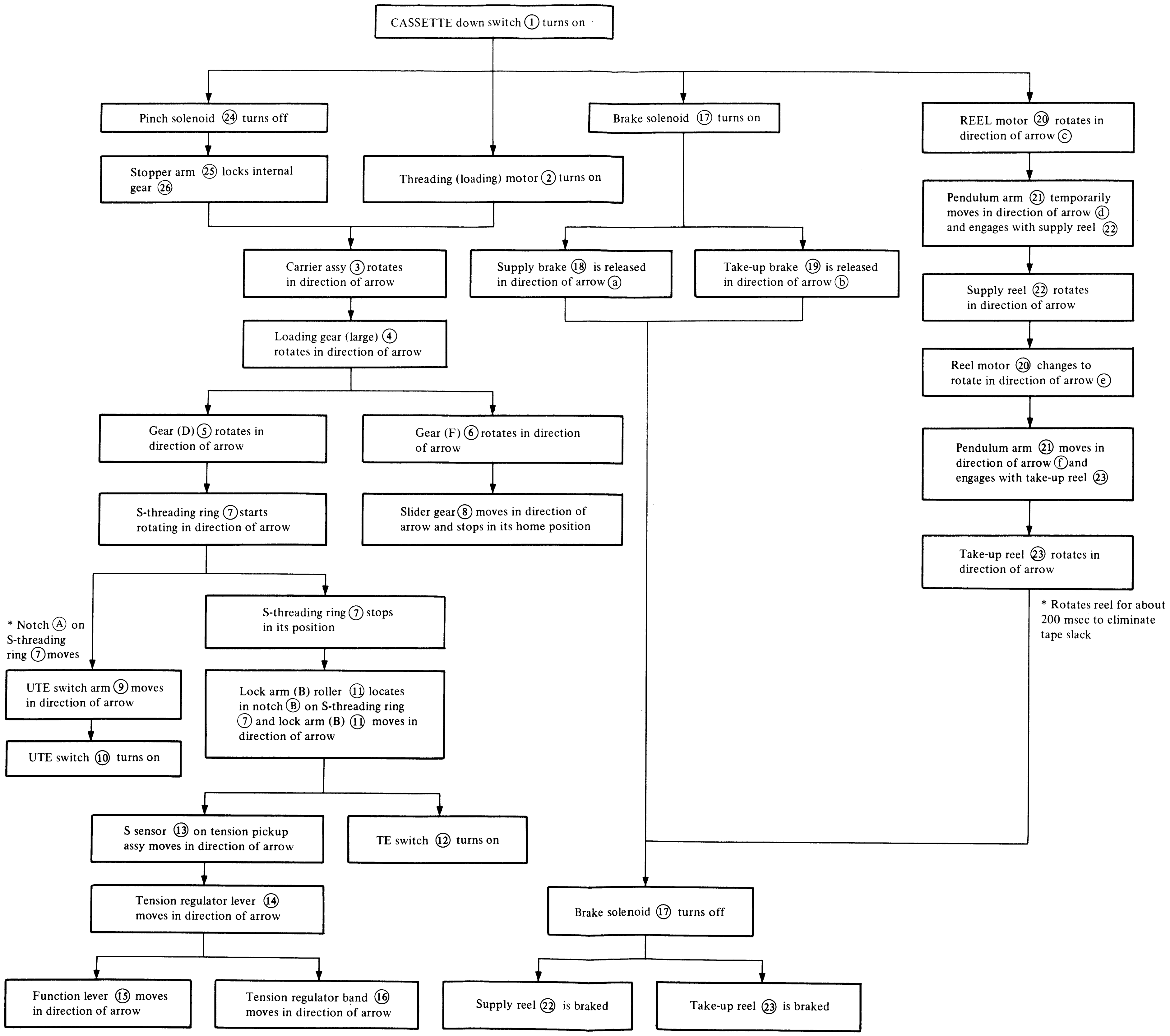
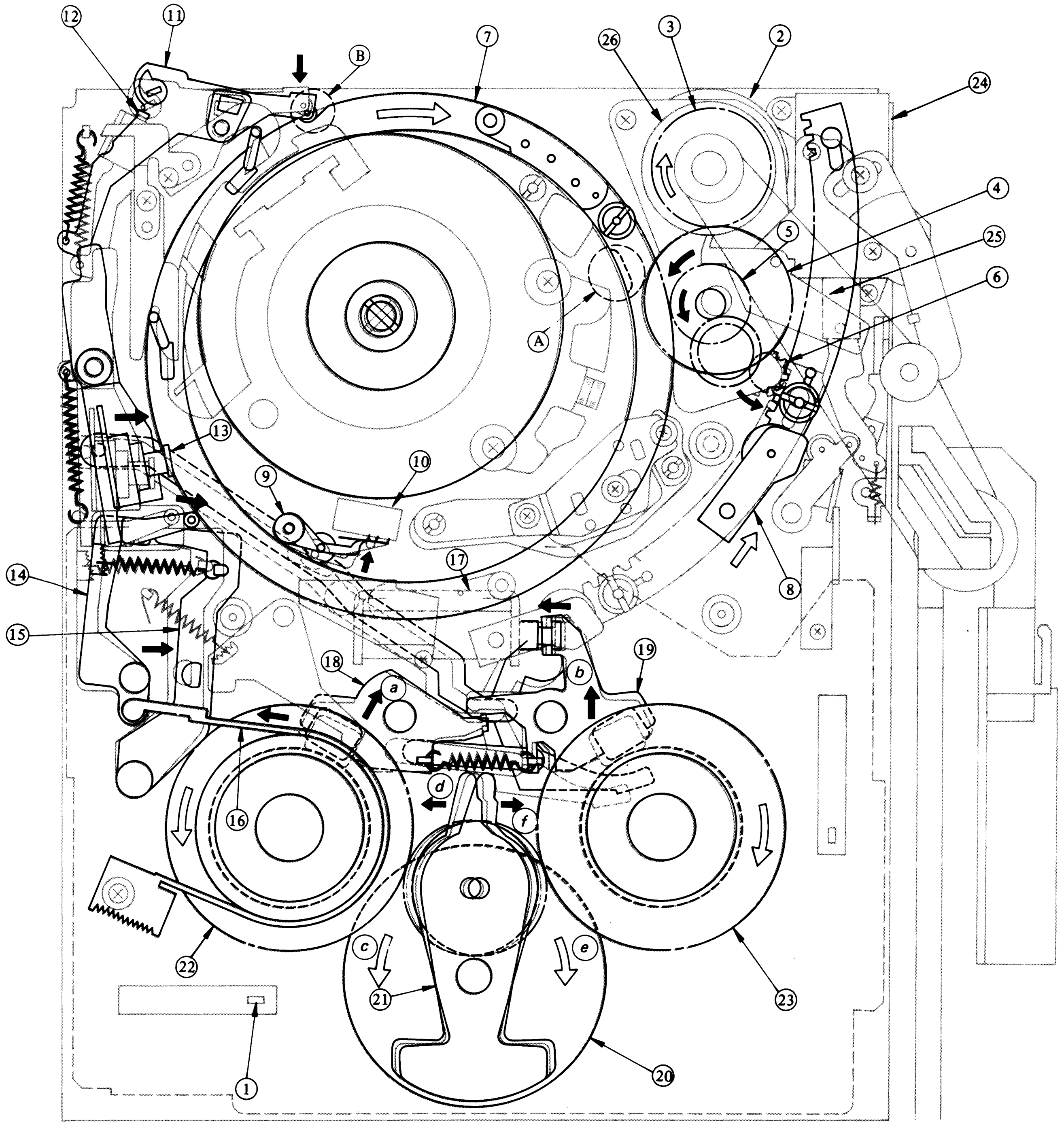
## 8-2. TAPE THREADING


CASSETTE down switch ① turns on
Pinch solenoid ㉔ turns off
Stopper arm ㉕ locks internal gear ㉖
Threading (loading) motor ② turns on
Brake solenoid ⑰ turns on
REEL motor ⑳ rotates in direction of arrow ⓒ
Pendulum arm ㉑ temporarily moves in direction of arrow ⓓ and engages with supply reel ㉒
Carrier assy ③ rotates in direction of arrow
Supply brake ⑱ is released in direction of arrow ⓐ
Take-up brake ⑲ is released in direction of arrow ⓑ
Supply reel ㉒ rotates in direction of arrow
Loading gear (large) ④ rotates in direction of arrow
Reel motor ⑳ changes to rotate in direction of arrow ⓔ
Gear (D) ⑤ rotates in direction of arrow
Gear (F) ⑥ rotates in direction of arrow
Pendulum arm ㉑ moves in direction of arrow ⓕ and engages with take-up reel ㉓
S-threading ring ⑦ starts rotating in direction of arrow
Slider gear ⑧ moves in direction of arrow and stops in its home position
Take-up reel ㉓ rotates in direction of arrow
* Rotates reel for about 200 msec to eliminate tape slack
S-threading ring ⑦ stops in its position
* Notch Ⓐ on S-threading ring ⑦ moves
UTE switch arm ⑨ moves in direction of arrow
UTE switch ⑩ turns on
Lock arm (B) roller ⑪ locates in notch Ⓑ on S-threading ring ⑦ and lock arm (B) ⑪ moves in direction of arrow
S sensor ⑬ on tension pickup assy moves in direction of arrow
TE switch ⑫ turns on
Tension regulator lever ⑭ moves in direction of arrow
Brake solenoid ⑰ turns off
Function lever ⑮ moves in direction of arrow
Tension regulator band ⑯ moves in direction of arrow
Supply reel ㉒ is braked
Take-up reel ㉓ is braked

This completes tape threading.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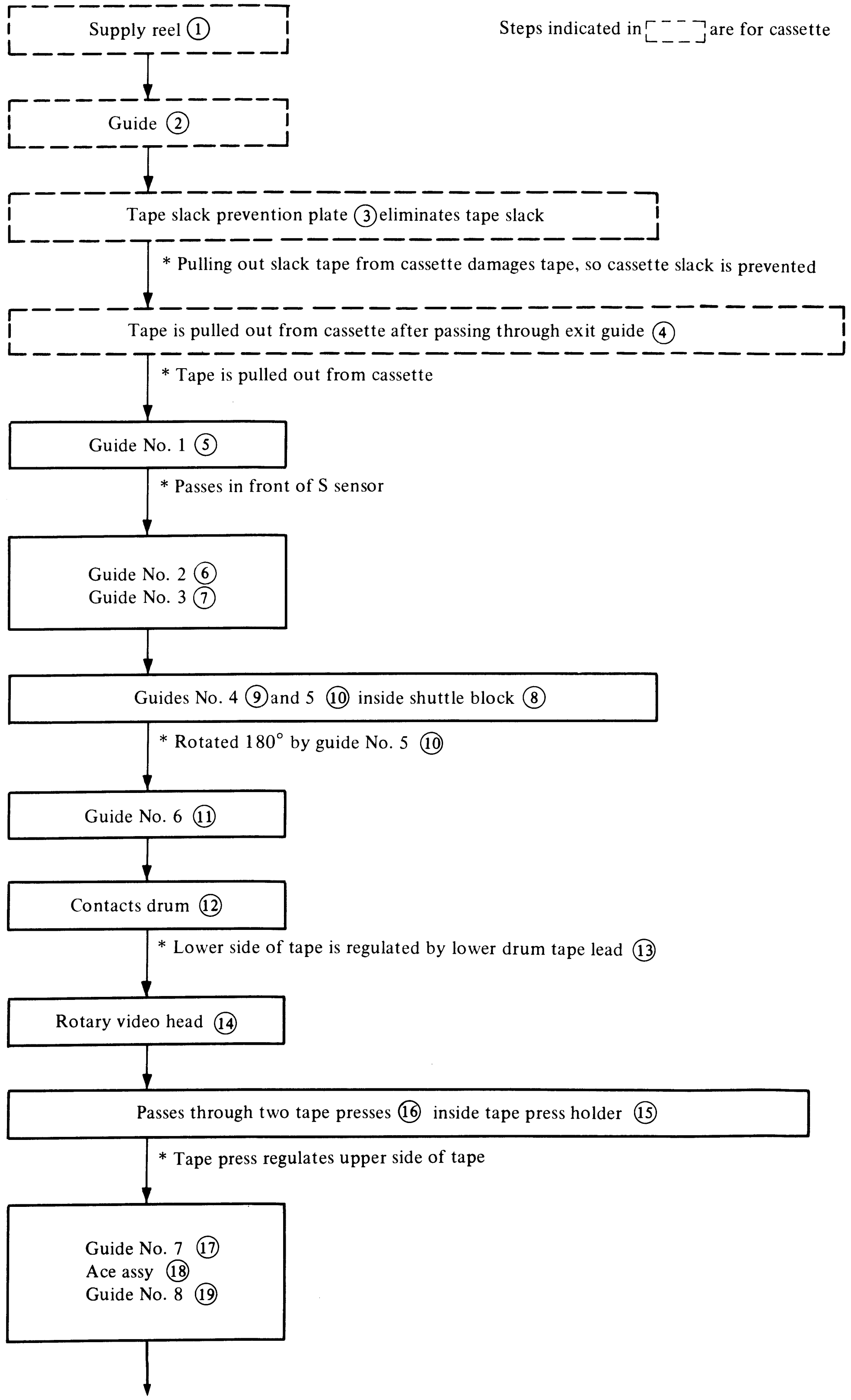
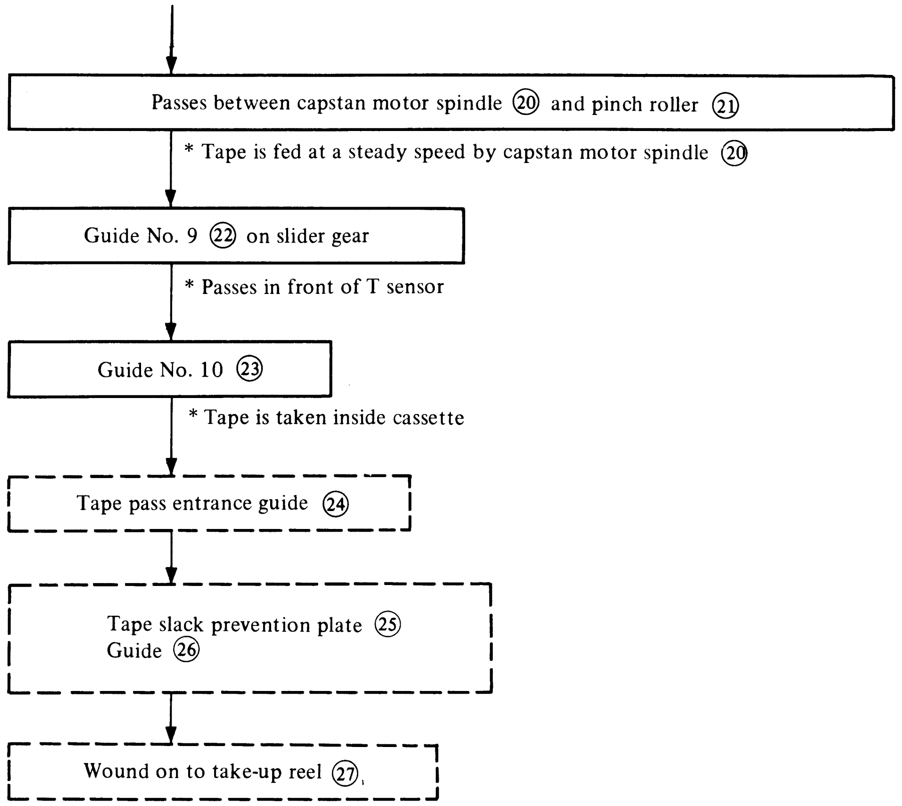
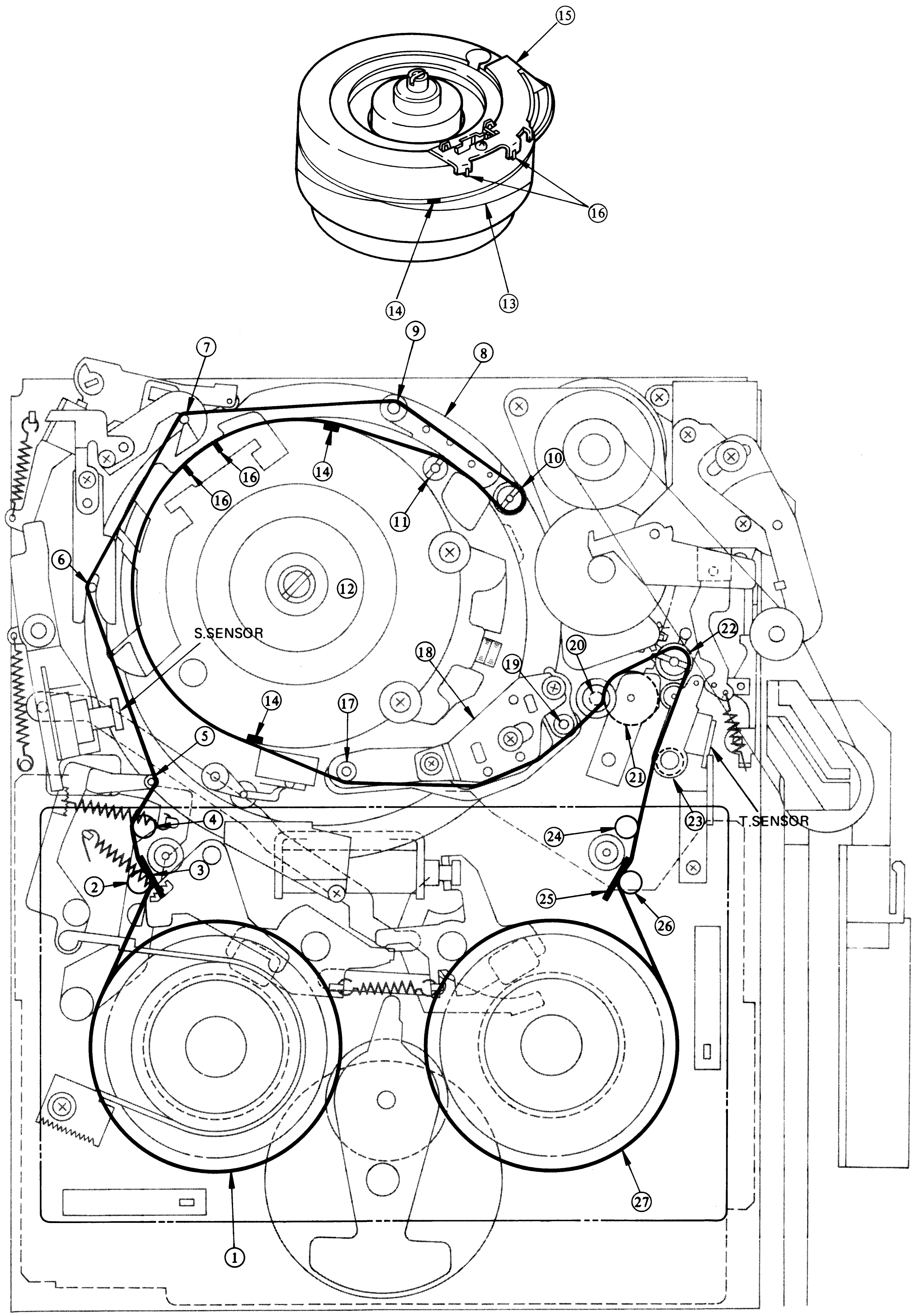
### 8-3. TAPE PATH


Supply reel ①
Steps indicated in ┌ ┐ are for cassette
Guide ②
Tape slack prevention plate ③eliminates tape slack
* Pulling out slack tape from cassette damages tape, so cassette slack is prevented
Tape is pulled out from cassette after passing through exit guide ④
* Tape is pulled out from cassette
Guide No. 1 ⑤
* Passes in front of S sensor
Guide No. 2 ⑥
Guide No. 3 ⑦
Guides No. 4 ⑨and 5 ⑩ inside shuttle block ⑧
* Rotated 180° by guide No. 5 ⑩
Guide No. 6 ⑪
Contacts drum ⑫
* Lower side of tape is regulated by lower drum tape lead ⑬
Rotary video head ⑭
Passes through two tape presses ⑯ inside tape press holder ⑮
* Tape press regulates upper side of tape
Guide No. 7 ⑰
Ace assy ⑱
Guide No. 8 ⑲


Passes between capstan motor spindle ⑳ and pinch roller ㉑
* Tape is fed at a steady speed by capstan motor spindle ⑳
Guide No. 9 ㉒ on slider gear
* Passes in front of T sensor
Guide No. 10 ㉓
* Tape is taken inside cassette
Tape pass entrance guide ㉔
Tape slack prevention plate ㉕
Guide ㉖
Wound on to take-up reel ㉗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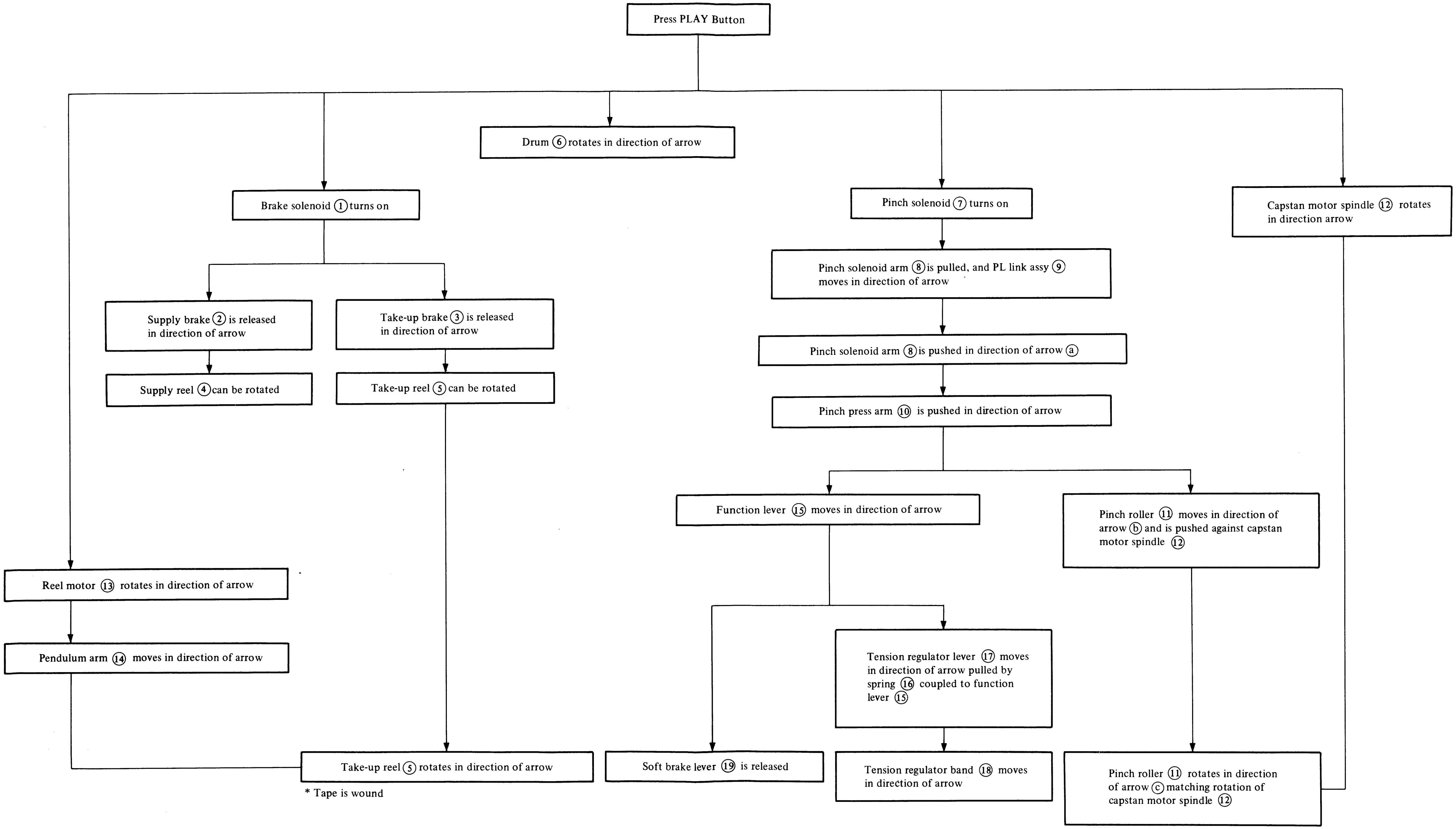
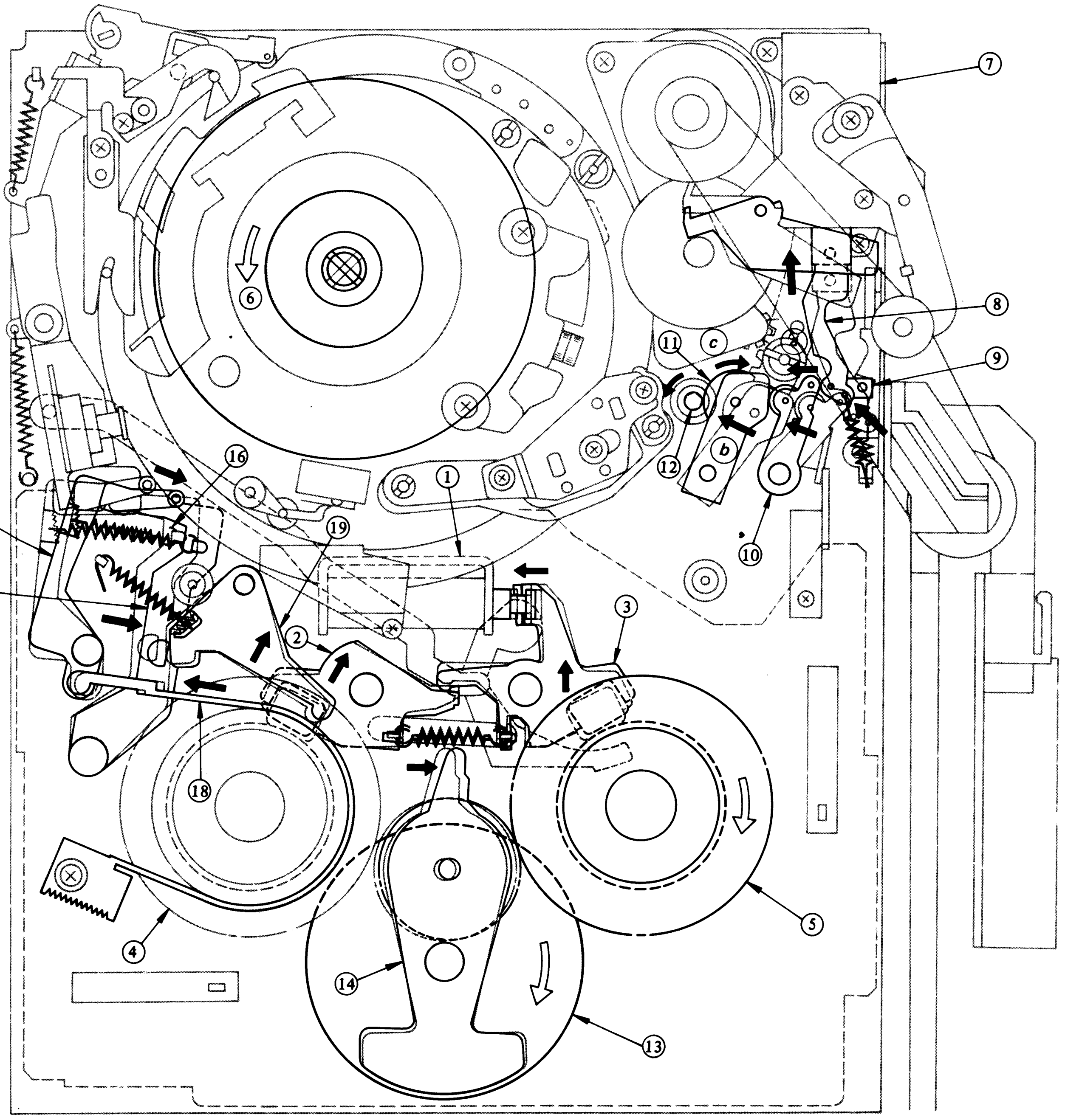
## 8-4. PLAY MODE


Press PLAY Button
Drum ⑥ rotates in direction of arrow
Brake solenoid ① turns on
Supply brake ② is released in direction of arrow
Take-up brake ③ is released in direction of arrow
Supply reel ④ can be rotated
Take-up reel ⑤ can be rotated
Reel motor ⑬ rotates in direction of arrow
Pendulum arm ⑭ moves in direction of arrow
Take-up reel ⑤ rotates in direction of arrow
* Tape is wound
Pinch solenoid ⑦ turns on
Pinch solenoid arm ⑧ is pulled, and PL link assy ⑨ moves in direction of arrow
Pinch solenoid arm ⑧ is pushed in direction of arrow ⓐ
Pinch press arm ⑩ is pushed in direction of arrow
Function lever ⑮ moves in direction of arrow
Soft brake lever ⑲ is released
Tension regulator lever ⑰ moves in direction of arrow pulled by spring ⑯ coupled to function lever ⑮
Tension regulator band ⑱ moves in direction of arrow
Pinch roller ⑪ moves in direction of arrow ⓑ and is pushed against capstan motor spindle ⑫
Pinch roller ⑪ rotates in direction of arrow ⓒ matching rotation of capstan motor spindle ⑫
Capstan motor spindle ⑫ rotates in direction arrow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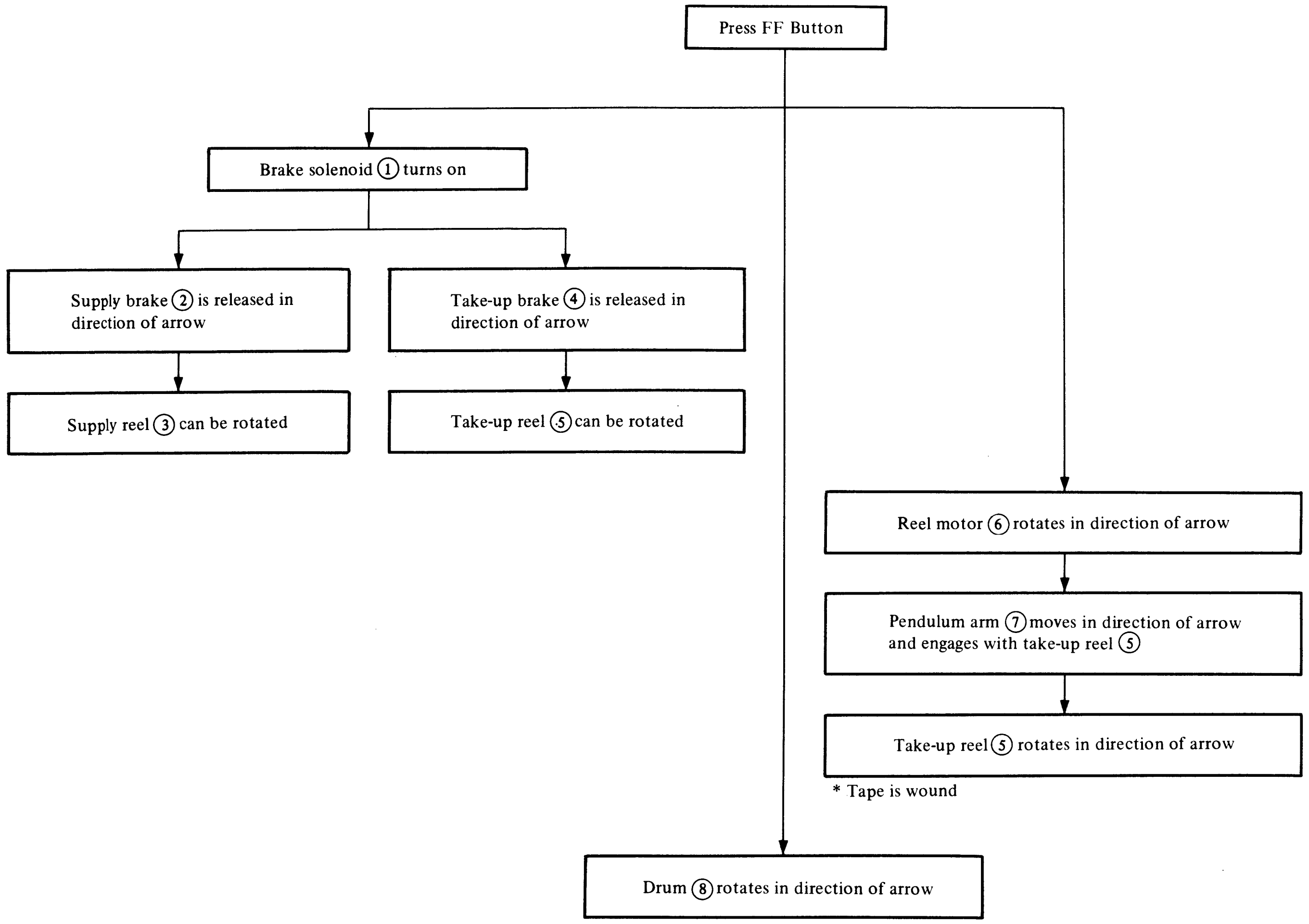
### 8-5. FF MODE



Press FF Button

Brake solenoid ① turns on

Supply brake ② is released in direction of arrow

Supply reel ③ can be rotated

Take-up brake ④ is released in direction of arrow

Take-up reel ⑤ can be rotated

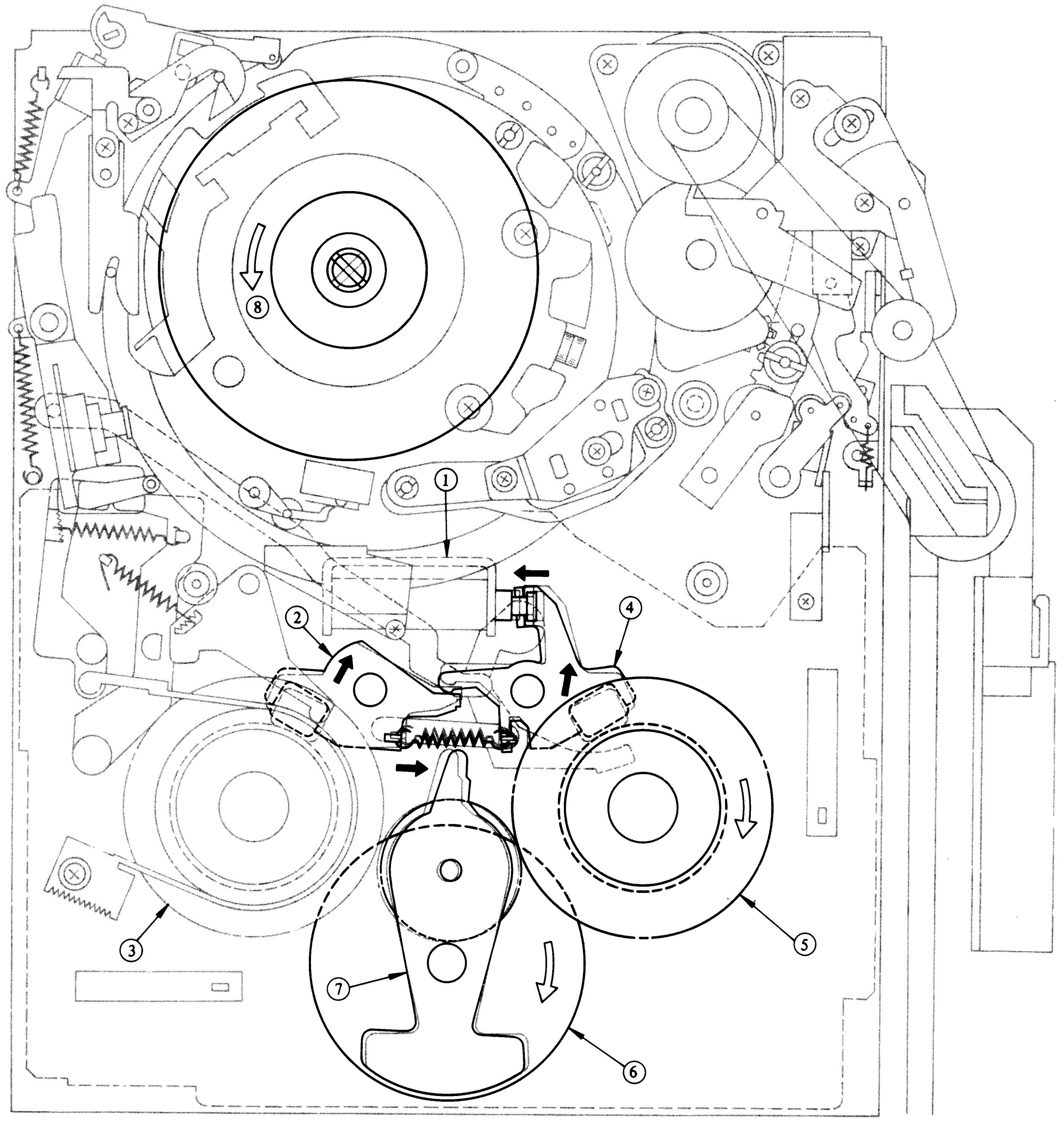
Reel motor ⑥ rotates in direction of arrow

Pendulum arm ⑦ moves in direction of arrow and engages with take-up reel ⑤

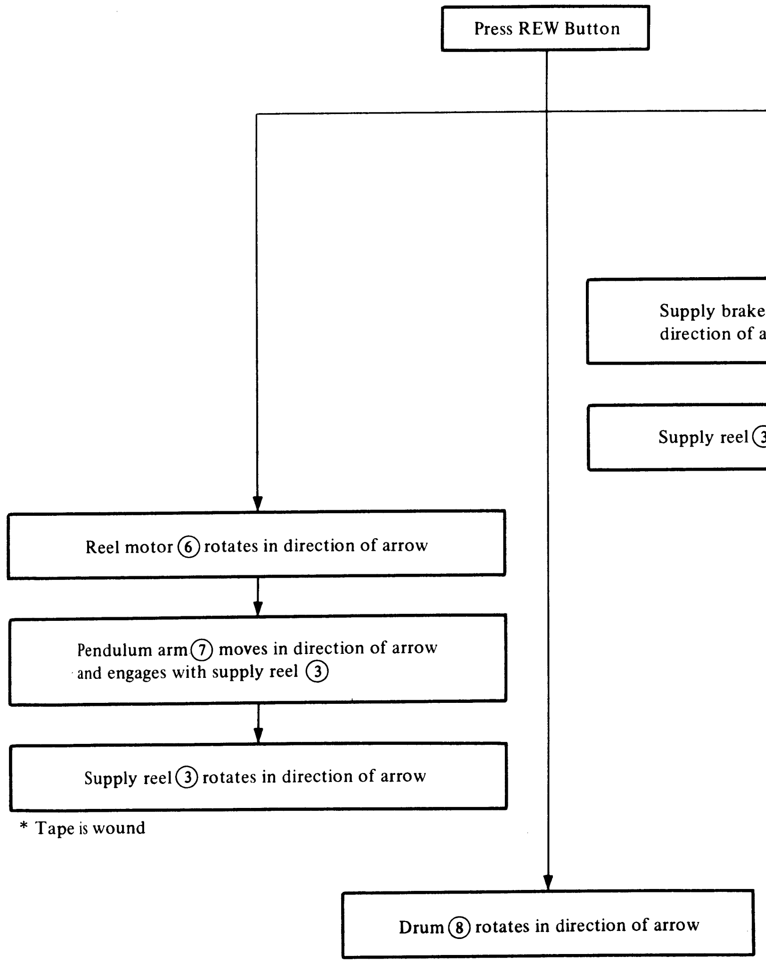
Take-up reel ⑤ rotates in direction of arrow

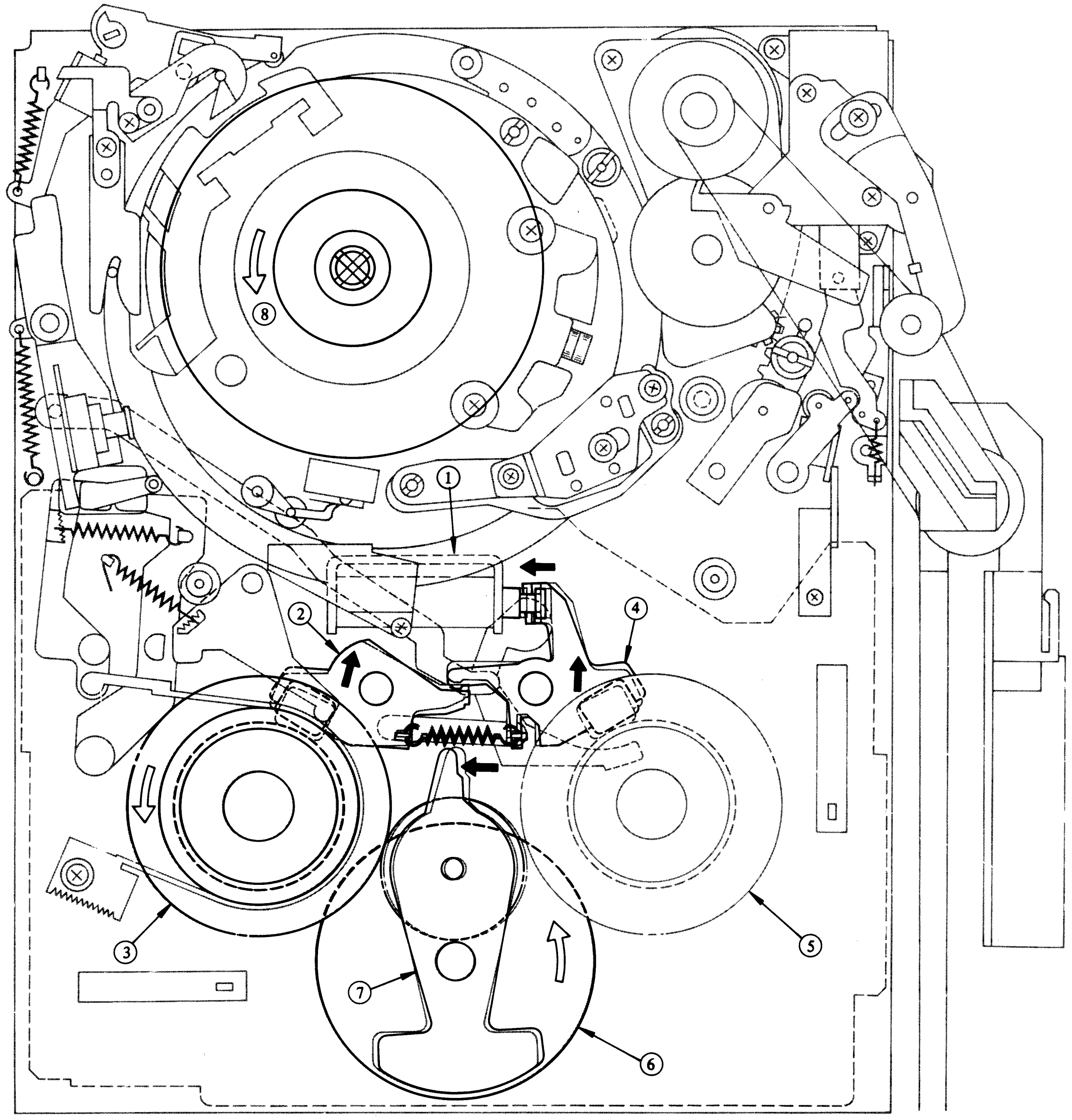
* Tape is wound

Drum ⑧ rotates in direction of arrow



## 8-6. REW MODE


Press REW Button
Brake solenoid ① turns on
Supply brake ② is released in direction of arrow
Take-up brake ④ is released in direction of arrow
Supply reel ③ can be rotated
Take-up reel ⑤ can be rotated
Reel motor ⑥ rotates in direction of arrow
Pendulum arm ⑦ moves in direction of arrow and engages with supply reel ③
Supply reel ③ rotates in direction of arrow
* Tape is wound
Drum ⑧ rotates in direction of arrow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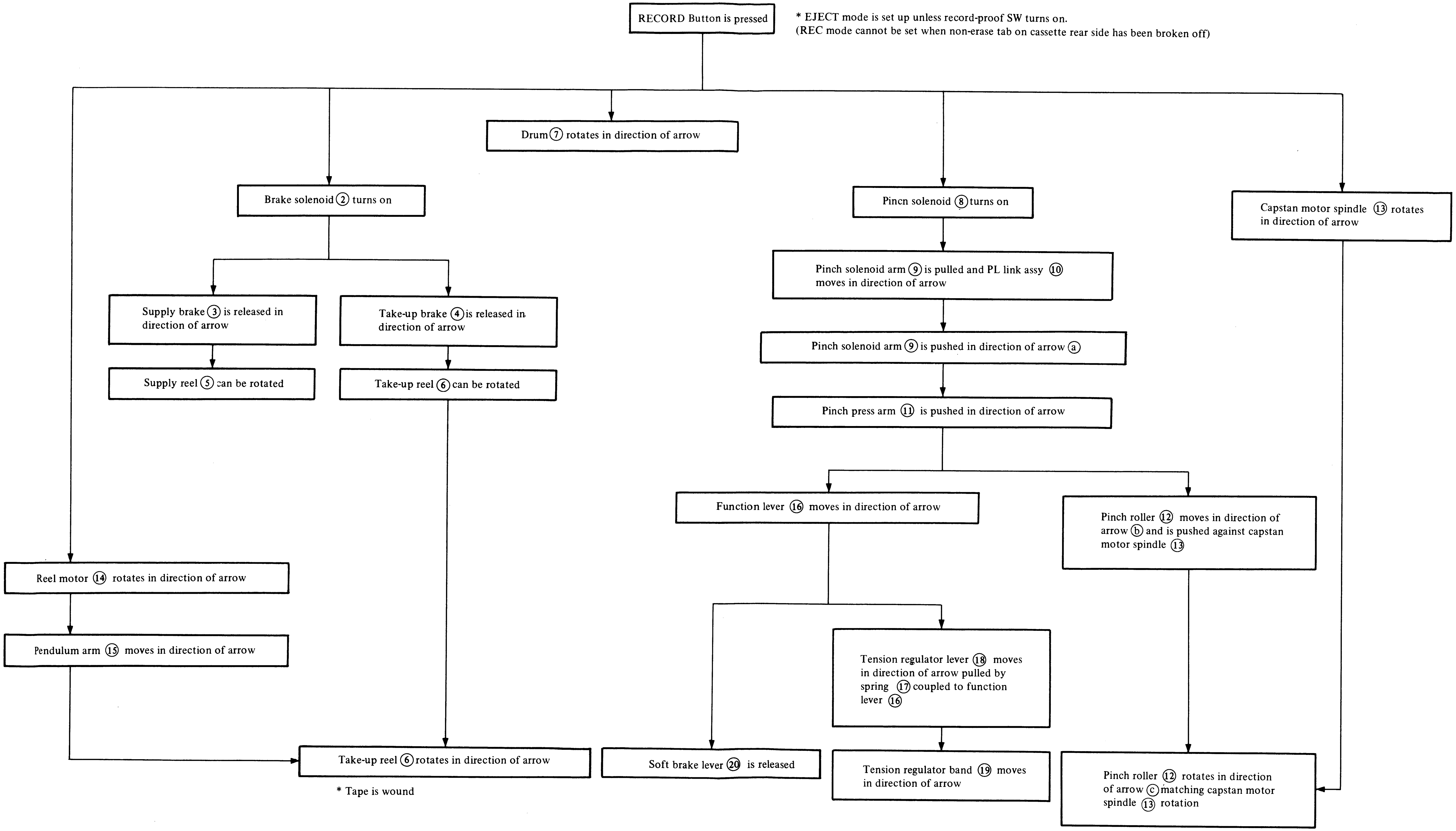
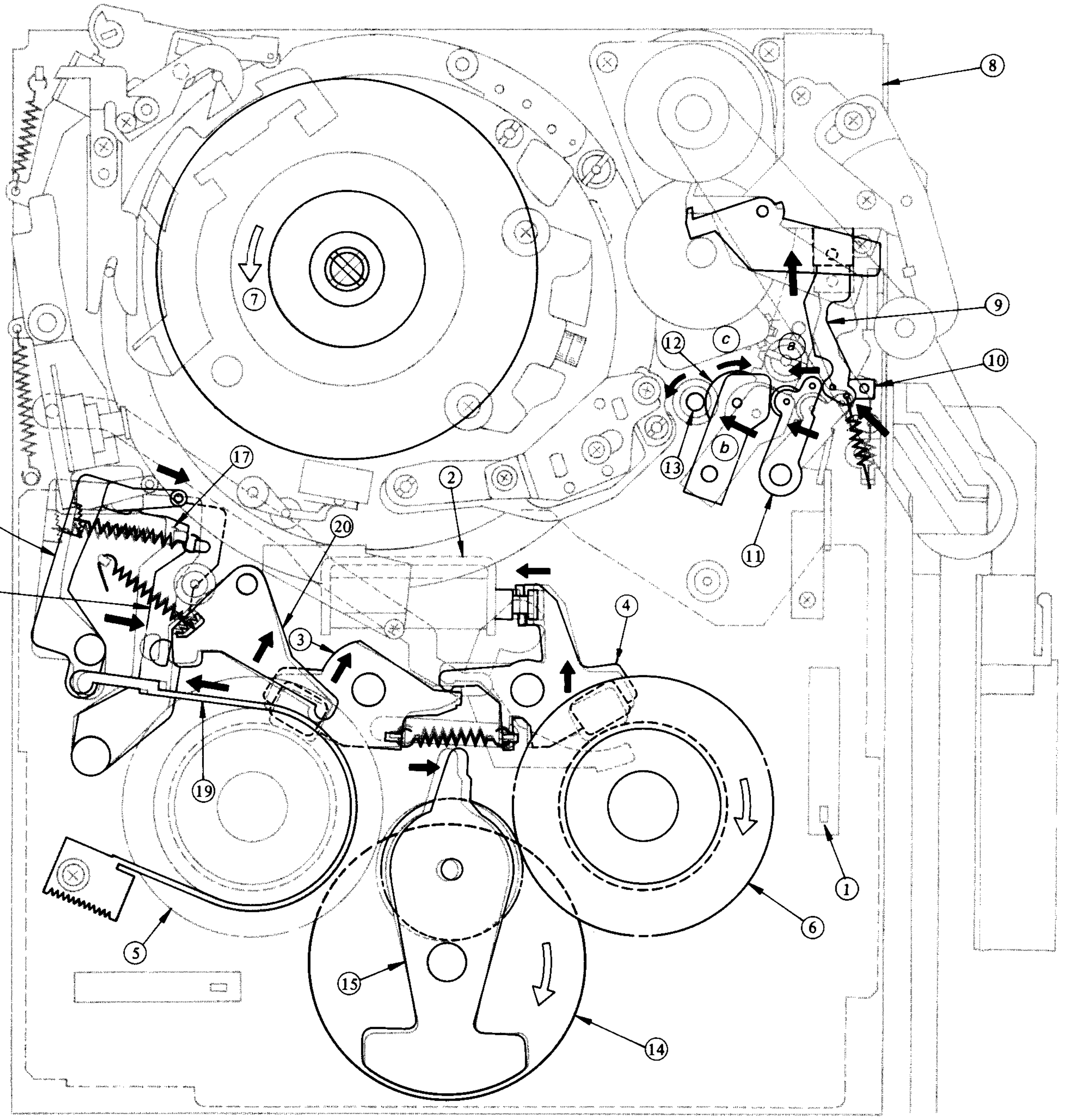
## 8-7. RECORD MODE


RECORD Button is pressed
Drum ⑦ rotates in direction of arrow
Brake solenoid ② turns on
Supply brake ③ is released in direction of arrow
Take-up brake ④ is released in direction of arrow
Supply reel ⑤ can be rotated
Take-up reel ⑥ can be rotated
Reel motor ⑭ rotates in direction of arrow
Pendulum arm ⑮ moves in direction of arrow
Take-up reel ⑥ rotates in direction of arrow
Pincn solenoid ⑧ turns on
Pinch solenoid arm ⑨ is pulled and PL link assy ⑩ moves in direction of arrow
Pinch solenoid arm ⑨ is pushed in direction of arrow ⓐ
Pinch press arm ⑪ is pushed in direction of arrow
Function lever ⑯ moves in direction of arrow
Soft brake lever ⑳ is released
Tension regulator lever ⑱ moves in direction of arrow pulled by spring ⑰ coupled to function lever ⑯
Tension regulator band ⑲ moves in direction of arrow
Pinch roller ⑫ moves in direction of arrow ⓑ and is pushed against capstan motor spindle ⑬
Pinch roller ⑫ rotates in direction of arrow ⓒ matching capstan motor spindle ⑬ rotation
Capstan motor spindle ⑬ rotates in direction of arrow

* EJECT mode is set up unless record-proof SW turns on.
(REC mode cannot be set when non-erase tab on cassette rear side has been broken off)

* Tape is wound



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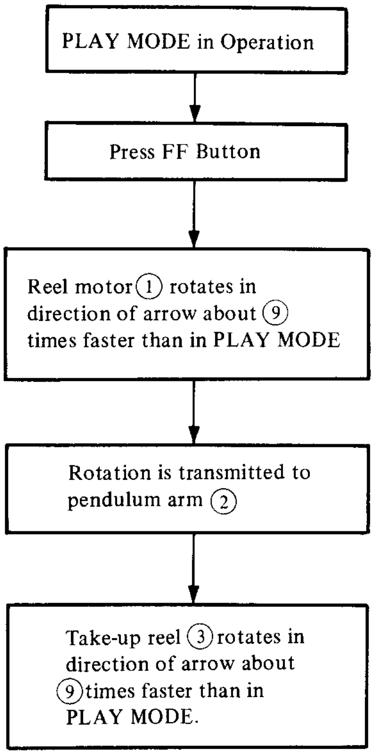
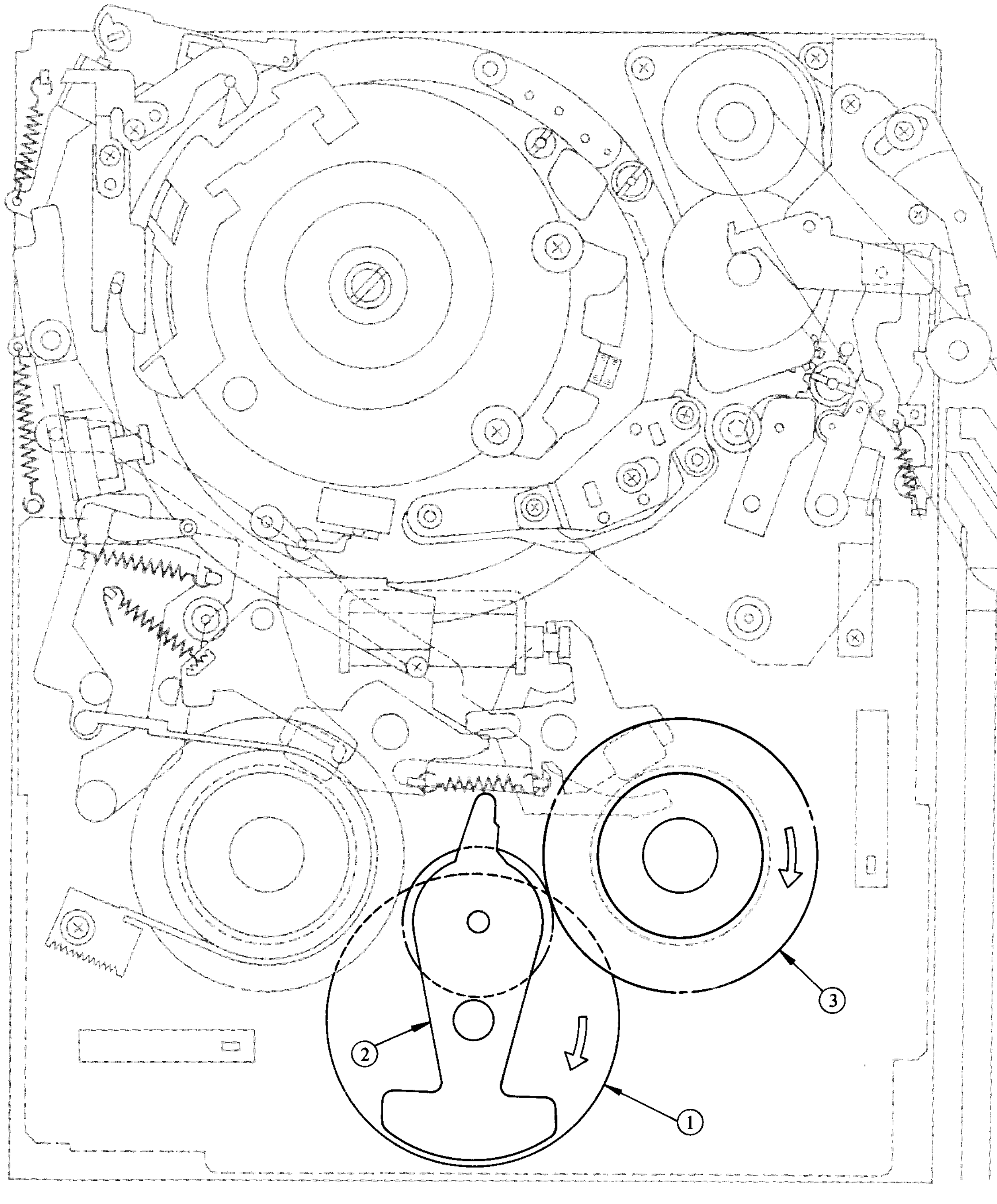
## 8-8. PICTURE SEARCH (CUE)


PLAY MODE in Operation
Press FF Button
Reel motor ① rotates in direction of arrow about ⑨ times faster than in PLAY MODE
Rotation is transmitted to pendulum arm ②
Take-up reel ③ rotates in direction of arrow about ⑨ times faster than in PLAY MODE.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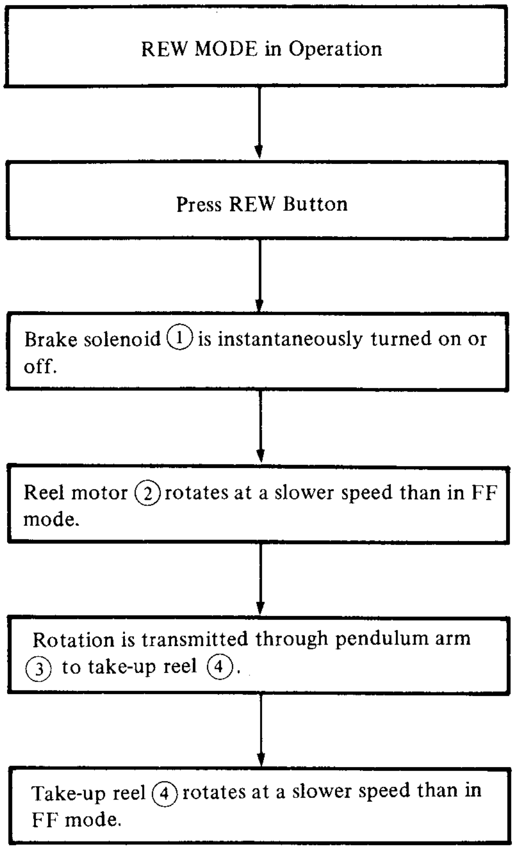
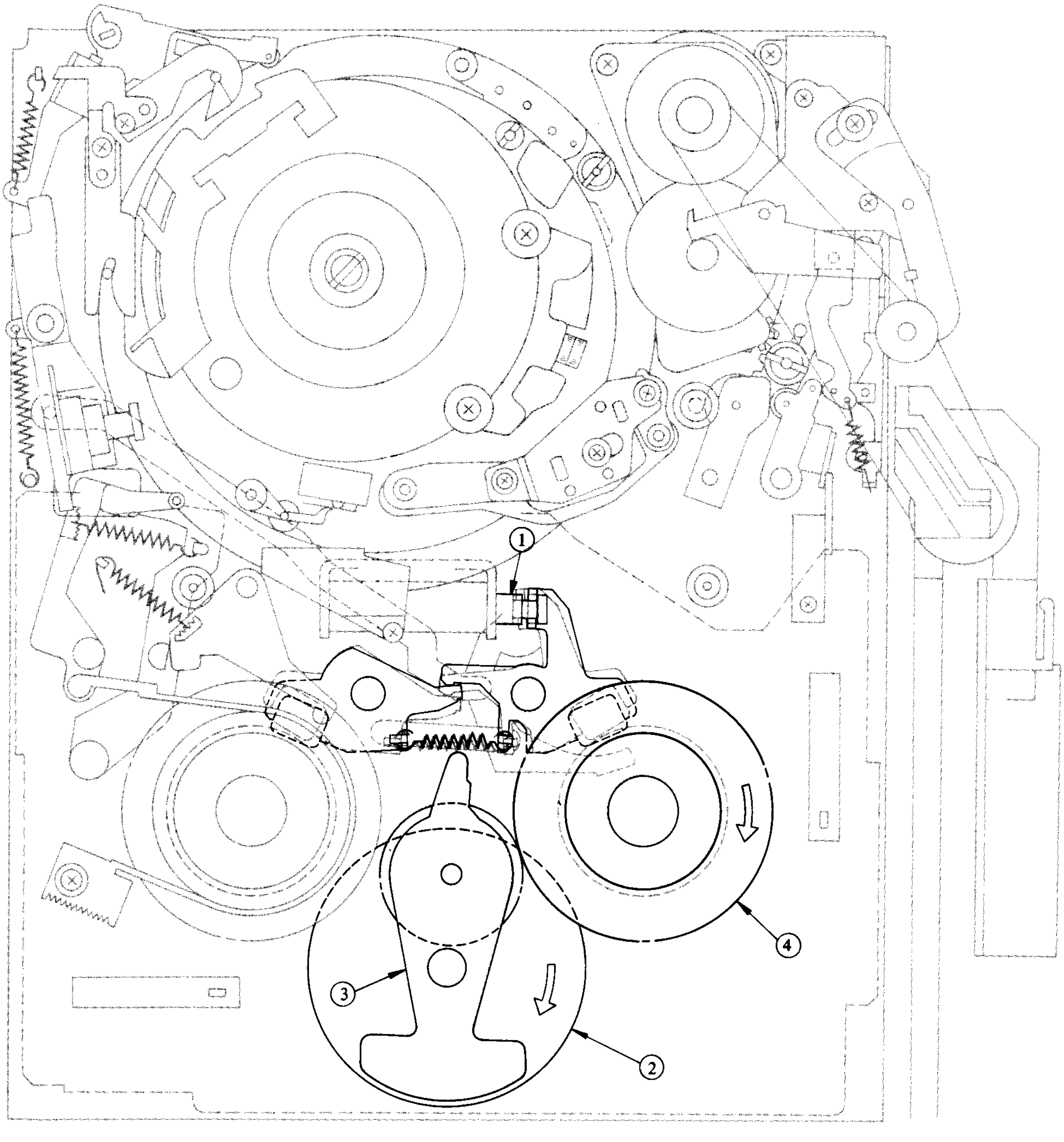
## 8-9. SKIP SCAN (CUE)


REW MODE in Operation
Press REW Button
Brake solenoid ① is instantaneously turned on or off.
Reel motor ② rotates at a slower speed than in FF mode.
Rotation is transmitted through pendulum arm ③ to take-up reel ④.
Take-up reel ④ rotates at a slower speed than in FF mode.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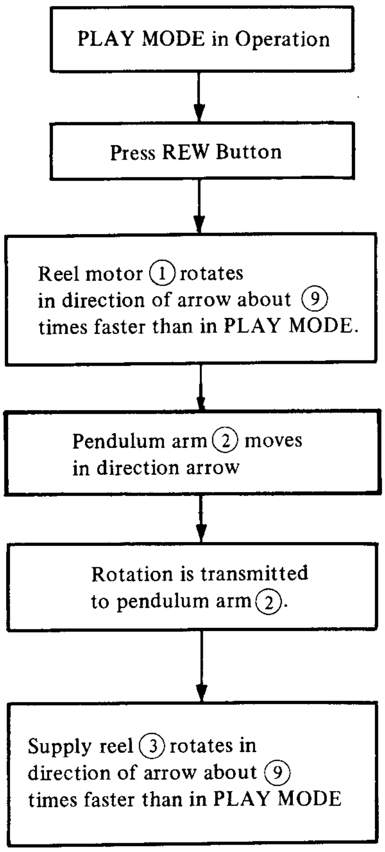
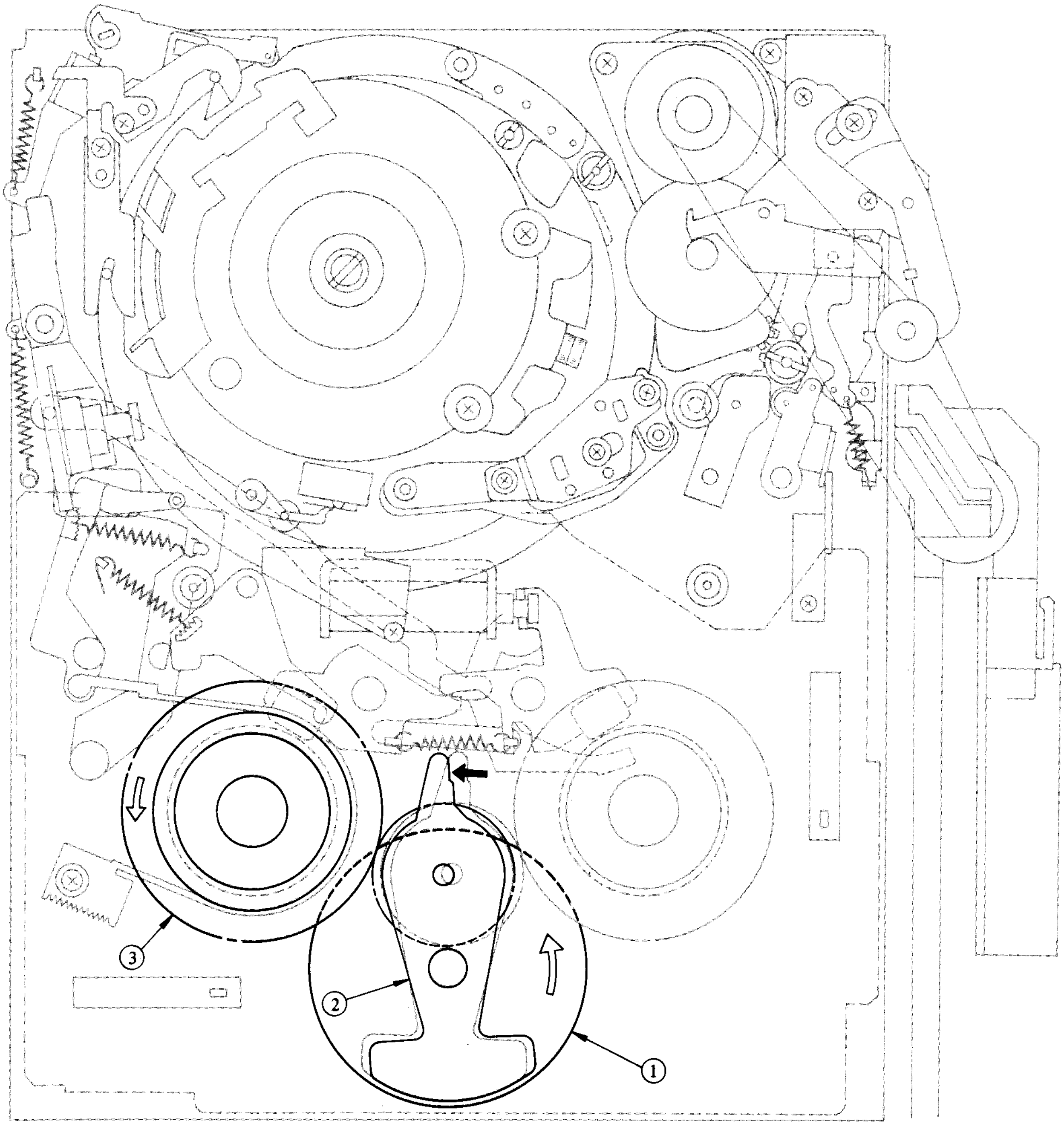
## 8-10. PICTURE SEARCH (REVIEW)


PLAY MODE in Operation
Press REW Button
Reel motor ① rotates in direction of arrow about ⑨ times faster than in PLAY MODE.
Pendulum arm ② moves in direction arrow
Rotation is transmitted to pendulum arm ②.
Supply reel ③ rotates in direction of arrow about ⑨ times faster than in PLAY MODE

* Supply reel rotates in opposite direction from PLAY mode.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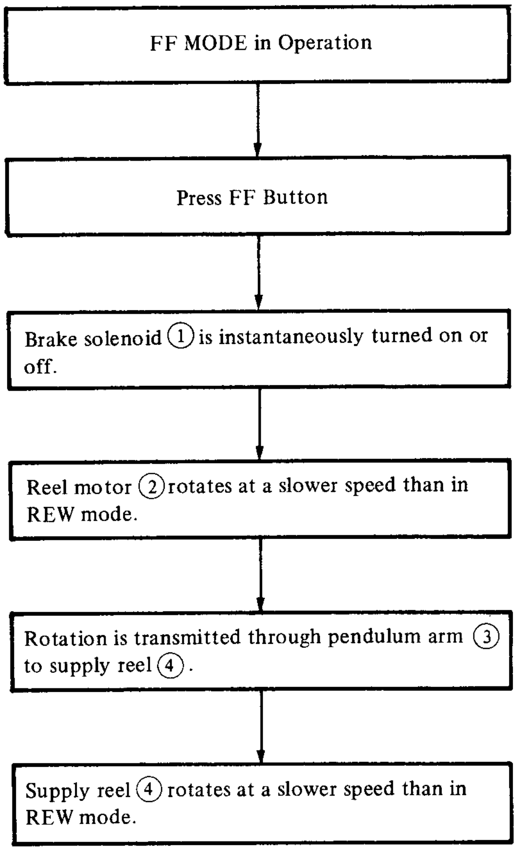
## 8-11. SKIP SCAN (REVIEW)



FF MODE in Operation

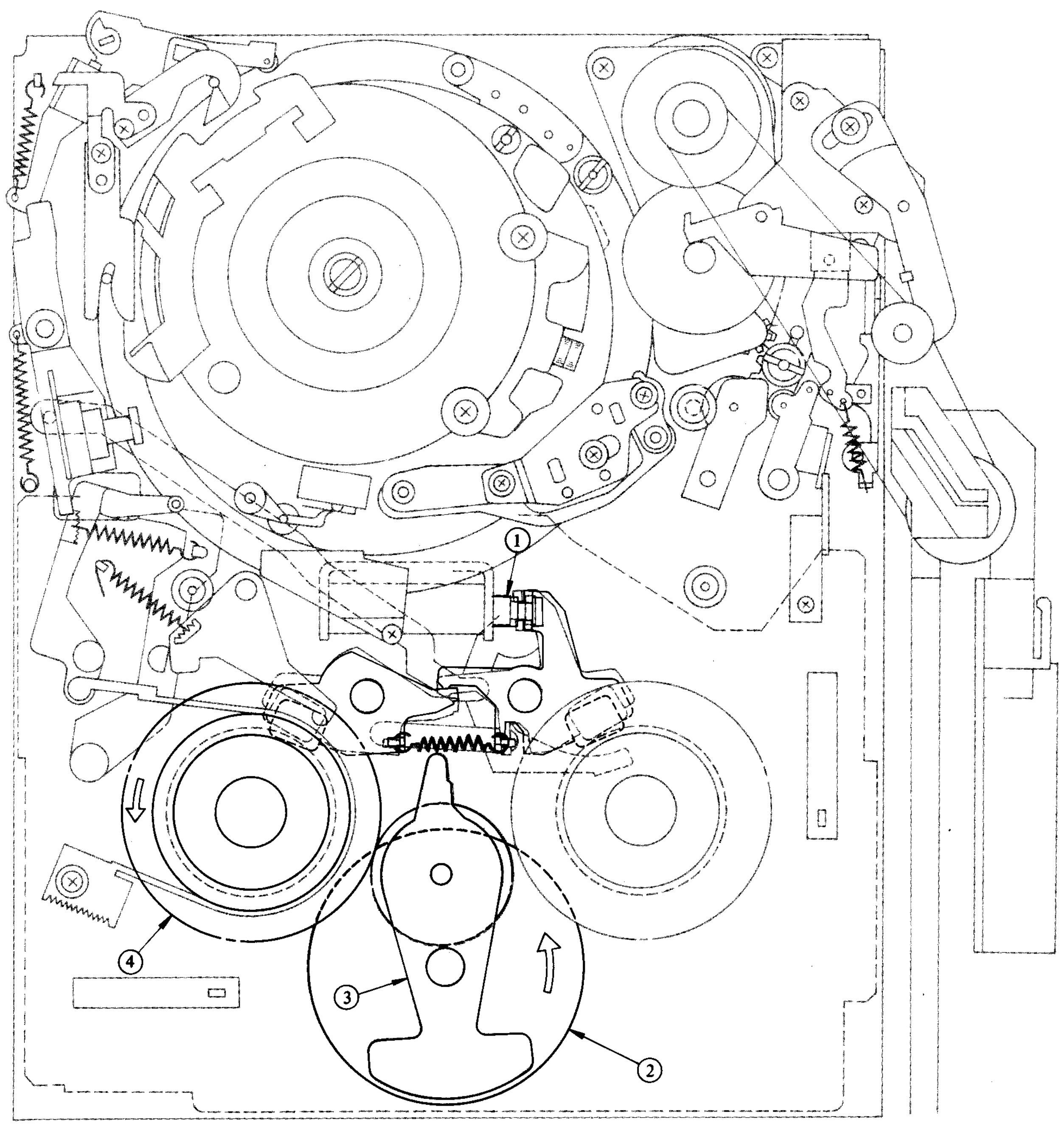
Press FF Button

Brake solenoid ① is instantaneously turned on or off.

Reel motor ② rotates at a slower speed than in REW mode.

Rotation is transmitted through pendulum arm ③ to supply reel ④.

Supply reel ④ rotates at a slower speed than in REW mode.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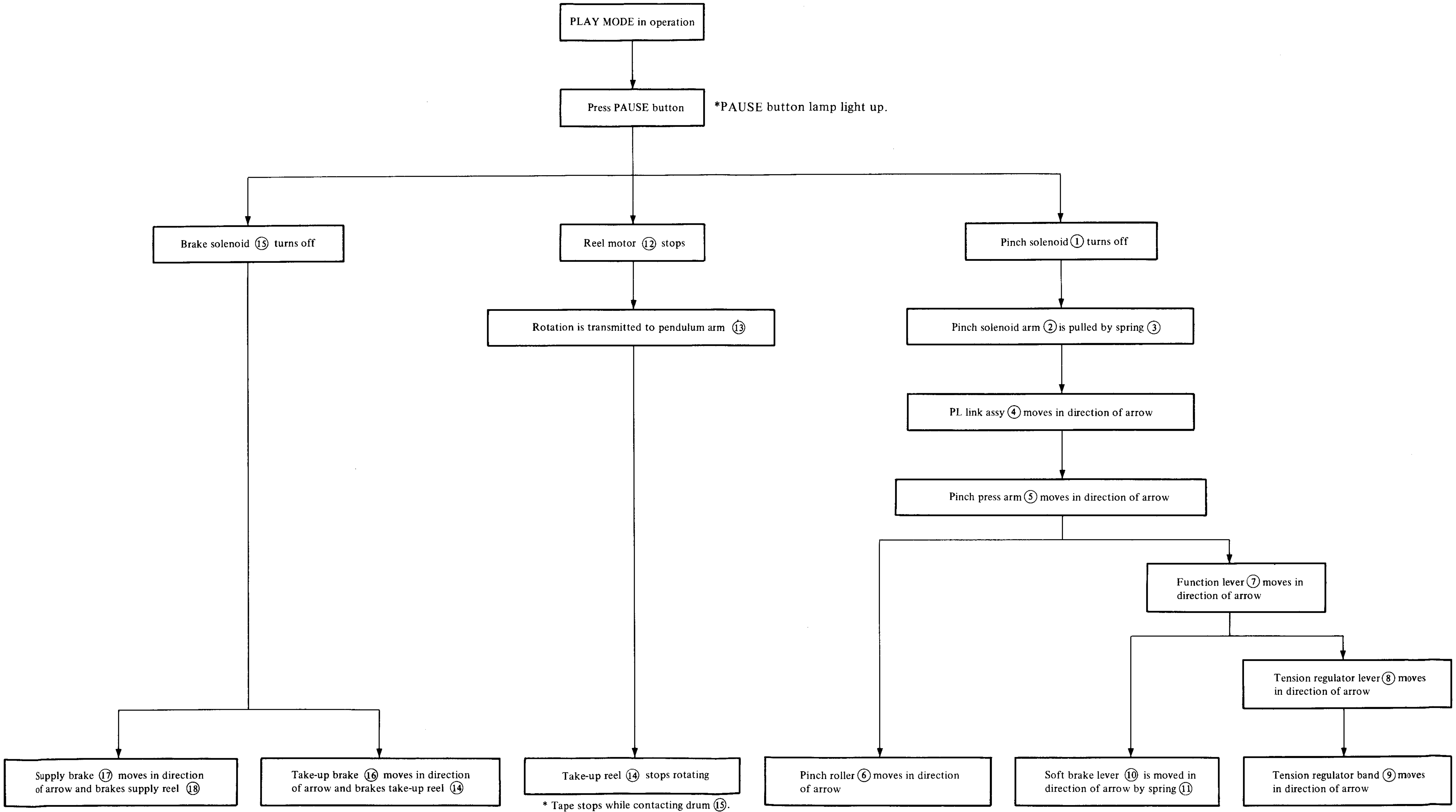
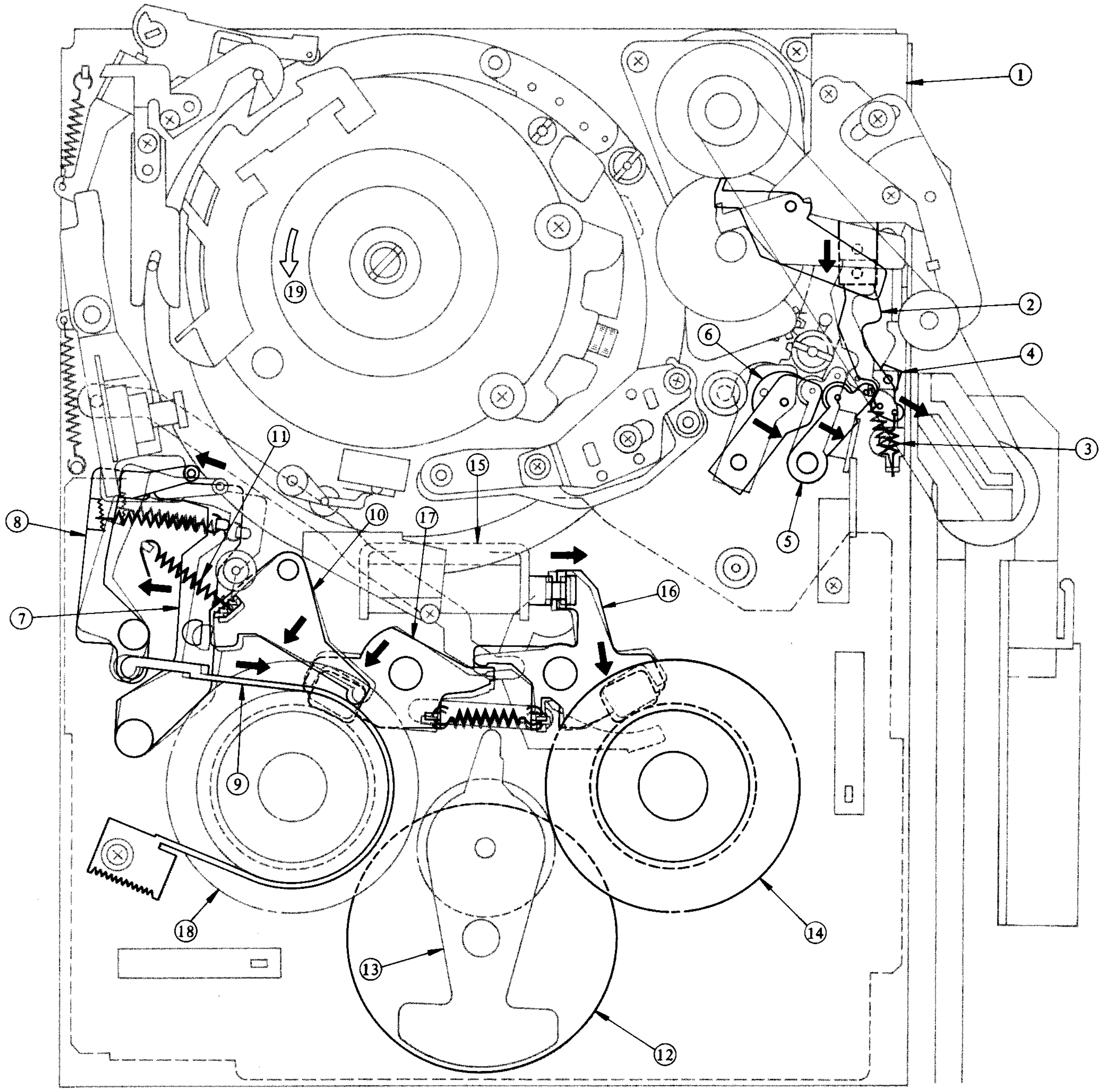
## 8-12. PAUSE (PLAY) MODE


PLAY MODE in operation
Press PAUSE button
Brake solenoid ⑮ turns off
Reel motor ⑫ stops
Pinch solenoid ① turns off
Rotation is transmitted to pendulum arm ⑬
Pinch solenoid arm ② is pulled by spring ③
PL link assy ④ moves in direction of arrow
Pinch press arm ⑤ moves in direction of arrow
Function lever ⑦ moves in direction of arrow
Tension regulator lever ⑧ moves in direction of arrow
Supply brake ⑰ moves in direction of arrow and brakes supply reel ⑱
Take-up brake ⑯ moves in direction of arrow and brakes take-up reel ⑭
Take-up reel ⑭ stops rotating
Pinch roller ⑥ moves in direction of arrow
Soft brake lever ⑩ is moved in direction of arrow by spring ⑪
Tension regulator band ⑨ moves in direction of arrow

*PAUSE button lamp light up.

* Tape stops while contacting drum ⑮. Drum ⑮ continues rotating and still pictures can be obtained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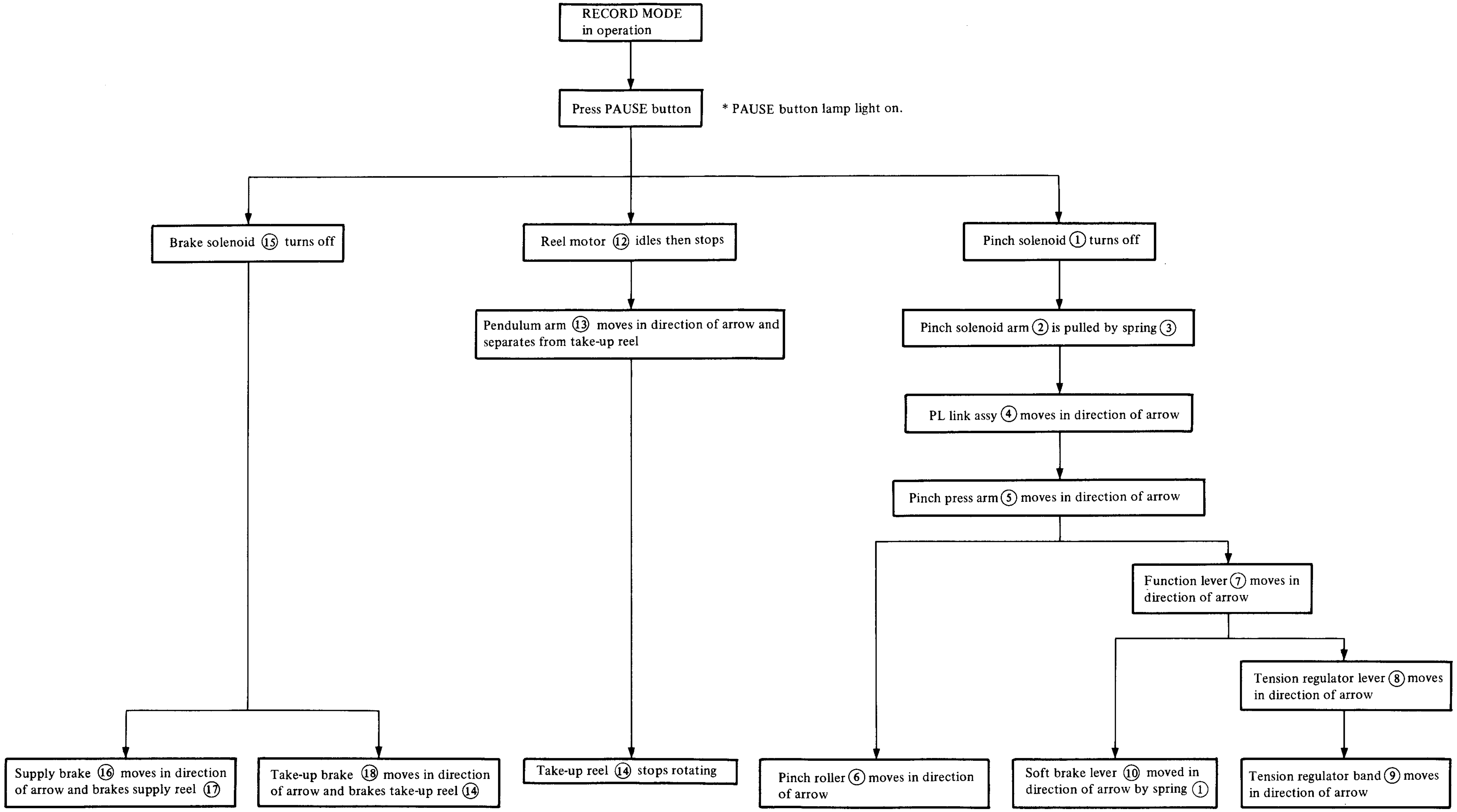
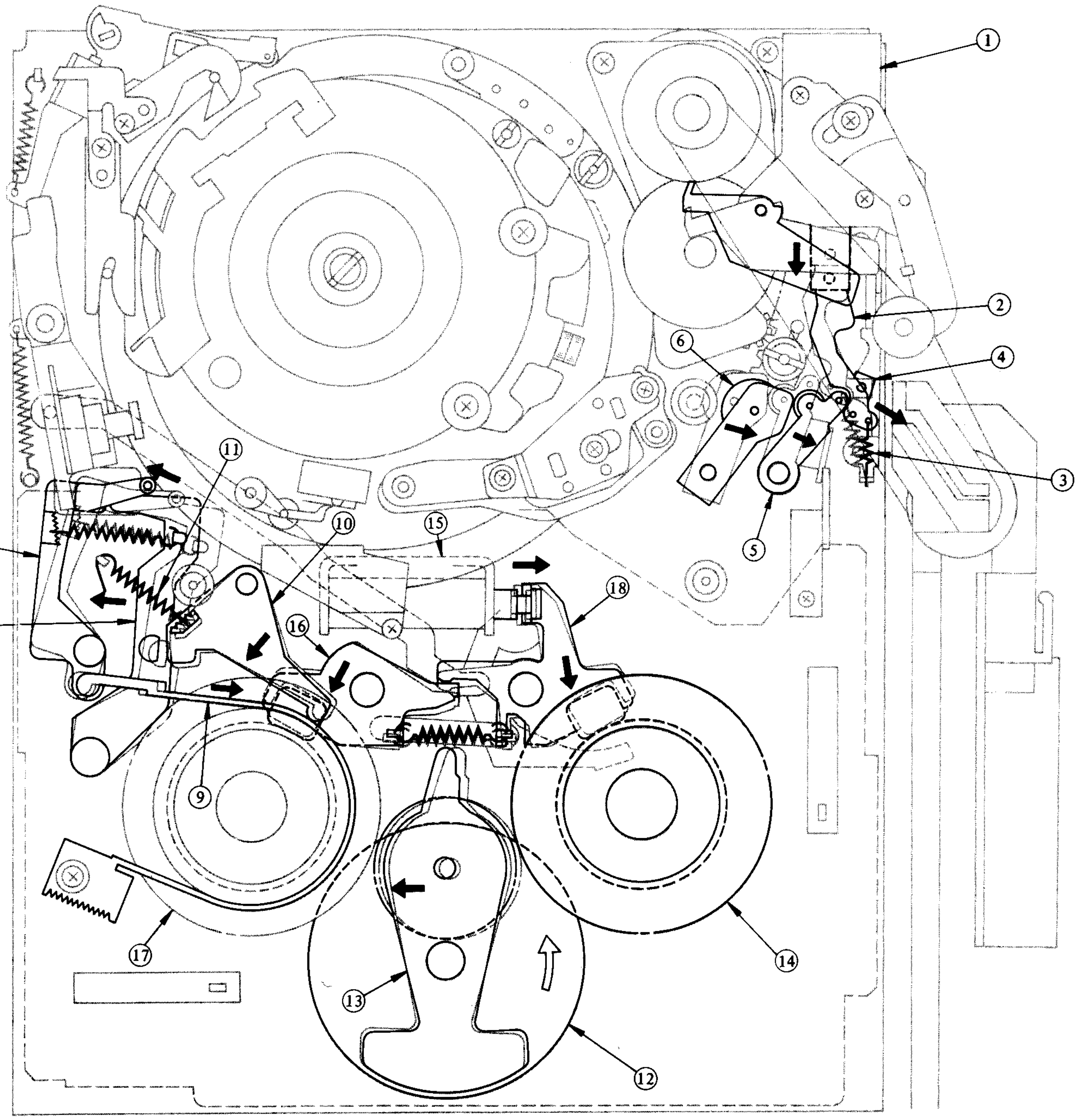
## 8-13. PAUSE (RECORD) MODE


RECORD MODE in operation
Press PAUSE button
* PAUSE button lamp light on.
Brake solenoid ⑮ turns off
Reel motor ⑫ idles then stops
Pinch solenoid ① turns off
Pendulum arm ⑬ moves in direction of arrow and separates from take-up reel
Pinch solenoid arm ② is pulled by spring ③
PL link assy ④ moves in direction of arrow
Pinch press arm ⑤ moves in direction of arrow
Function lever ⑦ moves in direction of arrow
Tension regulator lever ⑧ moves in direction of arrow
Supply brake ⑯ moves in direction of arrow and brakes supply reel ⑰
Take-up brake ⑱ moves in direction of arrow and brakes take-up reel ⑭
Take-up reel ⑭ stops rotating
Pinch roller ⑥ moves in direction of arrow
Soft brake lever ⑩ moved in direction of arrow by spring ①
Tension regulator band ⑨ moves in direction of arrow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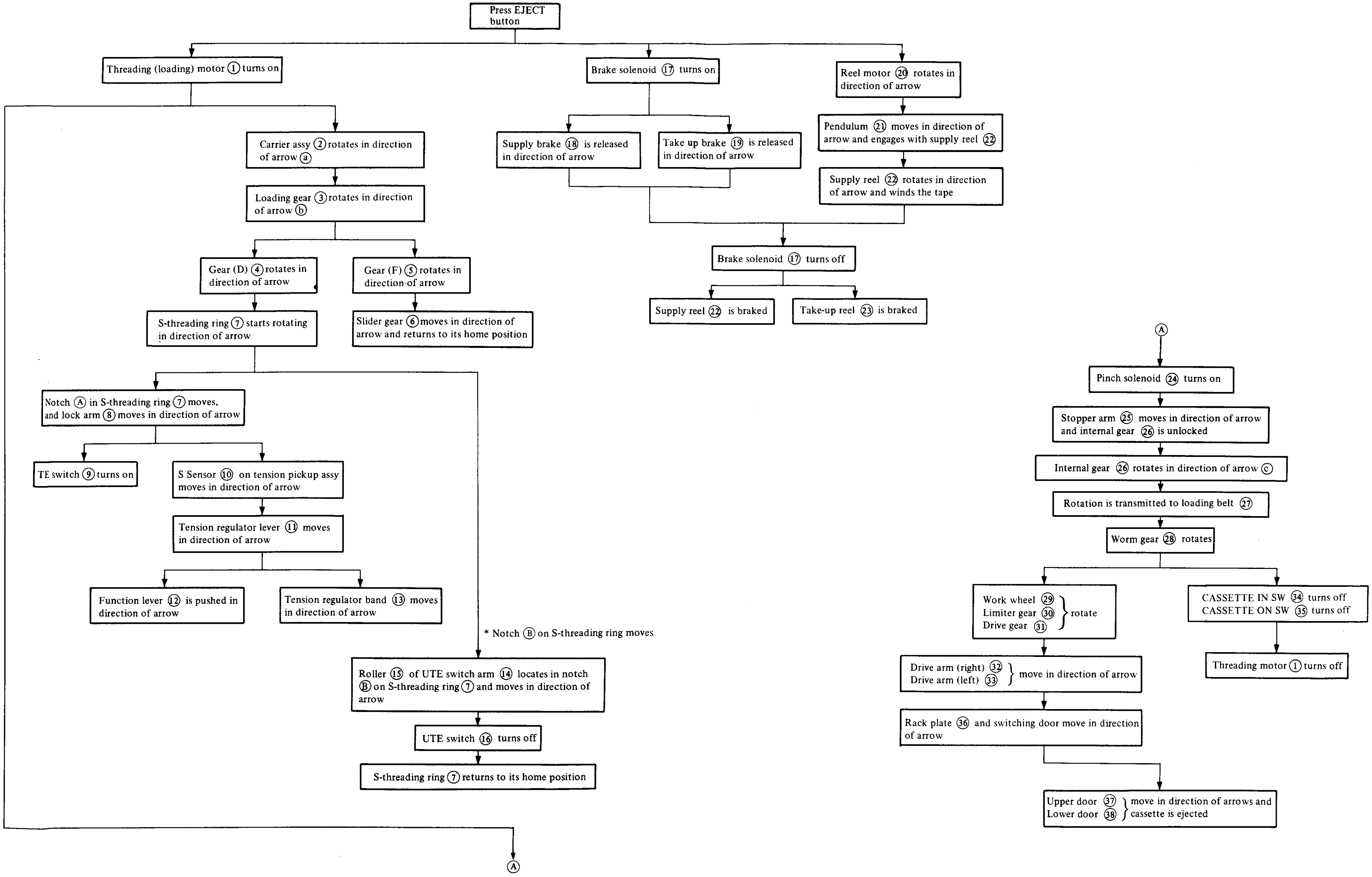
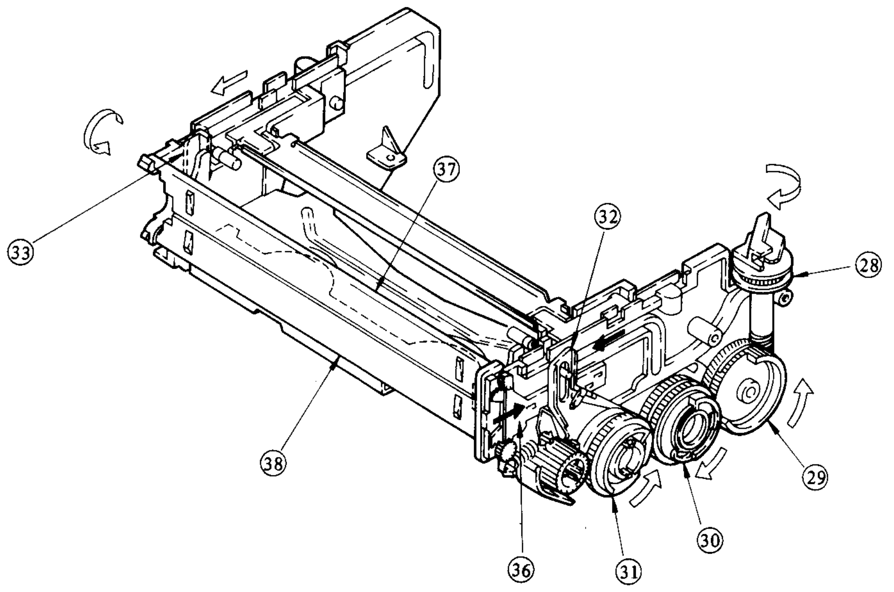
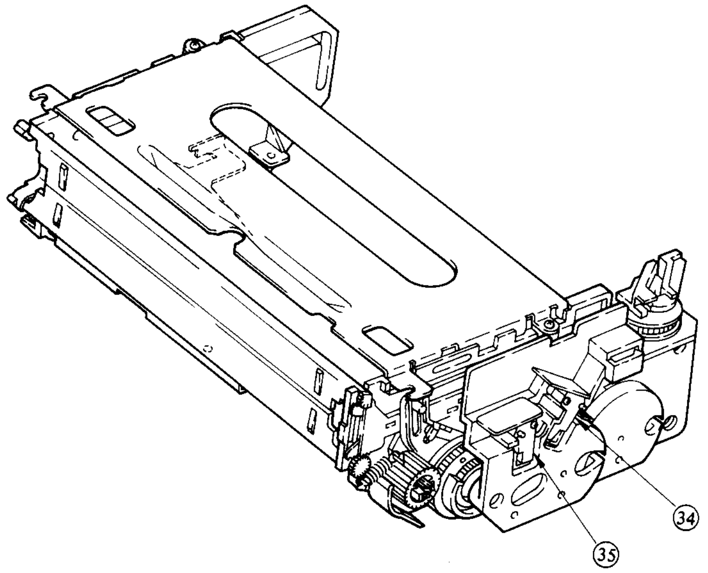
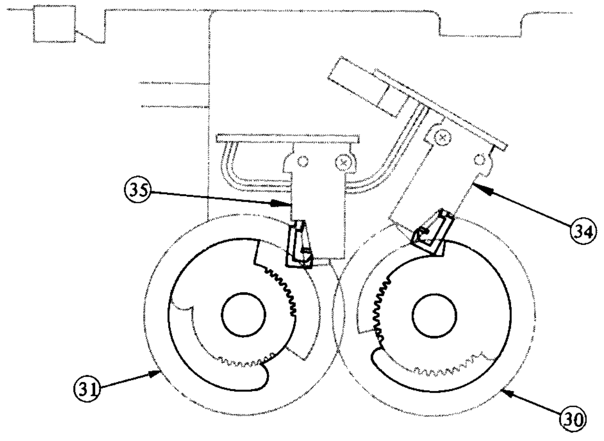
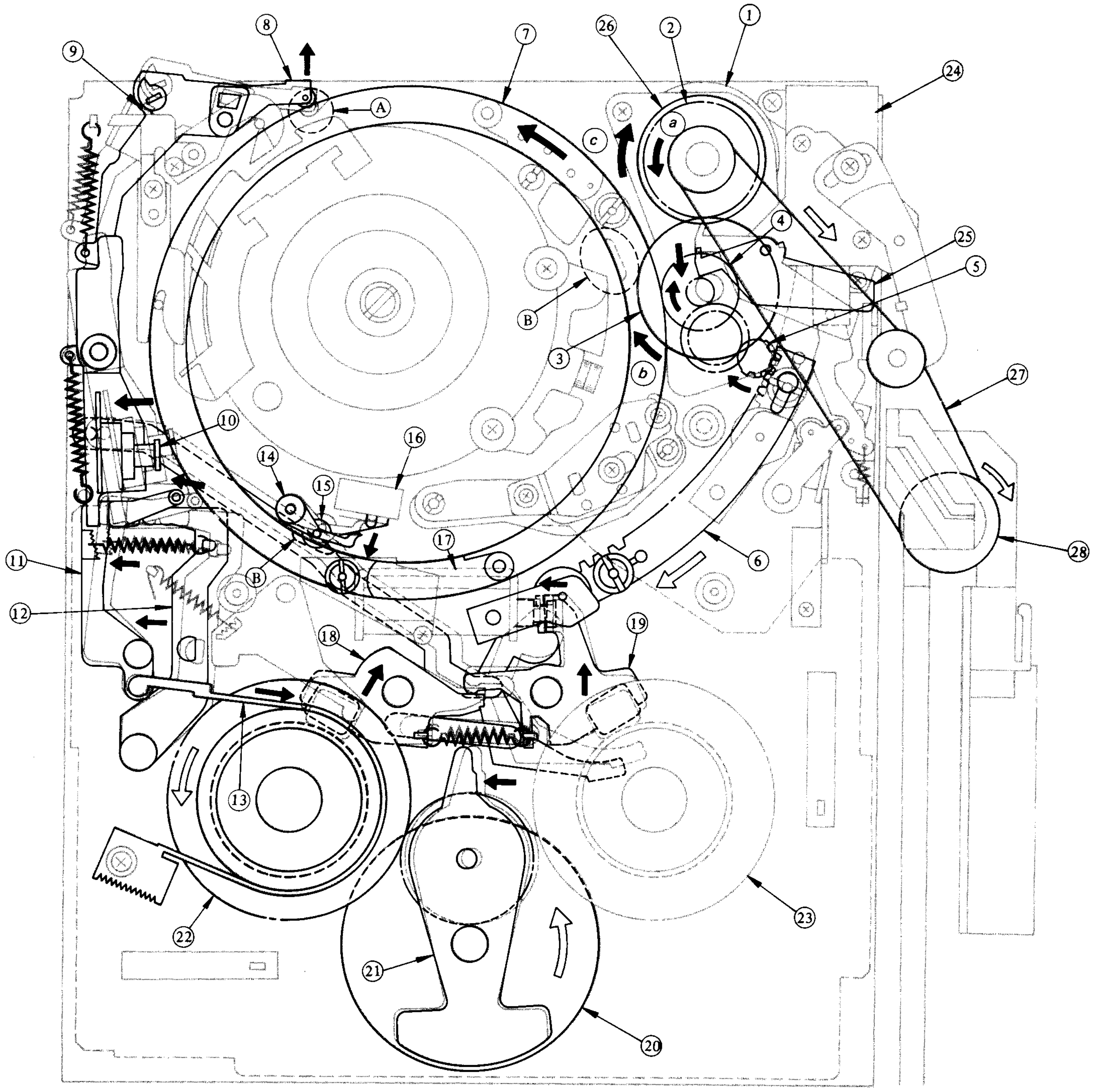
## 8-14. EJECT


Press EJECT button
Threading (loading) motor ① turns on
Brake solenoid ⑰ turns on
Reel motor ⑳ rotates in direction of arrow
Carrier assy ② rotates in direction of arrow ⓐ
Supply brake ⑱ is released in direction of arrow
Take up brake ⑲ is released in direction of arrow
Pendulum ㉑ moves in direction of arrow and engages with supply reel ㉒
Supply reel ㉒ rotates in direction of arrow and winds the tape
Loading gear ③ rotates in direction of arrow ⓑ
Brake solenoid ⑰ turns off
Gear (D) ④ rotates in direction of arrow
Gear (F) ⑤ rotates in direction of arrow
Supply reel ㉒ is braked
Take-up reel ㉓ is braked
S-threading ring ⑦ starts rotating in direction of arrow
Slider gear ⑥ moves in direction of arrow and returns to its home position
Notch Ⓐ in S-threading ring ⑦ moves, and lock arm ⑧ moves in direction of arrow
TE switch ⑨ turns on
S Sensor ⑩ on tension pickup assy moves in direction of arrow
Tension regulator lever ⑪ moves in direction of arrow
Function lever ⑫ is pushed in direction of arrow
Tension regulator band ⑬ moves in direction of arrow
* Notch Ⓑ on S-threading ring moves
Roller ⑮ of UTE switch arm ⑭ locates in notch Ⓑ on S-threading ring ⑦ and moves in direction of arrow
UTE switch ⑯ turns off
S-threading ring ⑦ returns to its home position
Ⓐ
Ⓐ
Pinch solenoid ㉔ turns on
Stopper arm ㉕ moves in direction of arrow and internal gear ㉖ is unlocked
Internal gear ㉖ rotates in direction of arrow ⓒ
Rotation is transmitted to loading belt ㉗
Worm gear ㉘ rotates
Work wheel ㉙ Limiter gear ㉚ Drive gear ㉛ } rotate
CASSETTE IN SW ㉞ turns off
CASSETTE ON SW ㉟ turns off
Threading motor ① turns off
Drive arm (right) ㉜ Drive arm (left) ㉝ } move in direction of arrow
Rack plate ㊱ and switching door move in direction of arrow
Upper door ㊲ Lower door ㊳ } move in direction of arrows and cassette is ejected


㉝
㊲
㉜
㉘
㊳
㉙
㊱
㉛
㉚


㉞
㉟


㉟
㉞
㉛
㉚


⑨
⑧
⑦
㉖
②
①
㉔
Ⓐ
c
a
④
㉕
⑤
Ⓑ
③
b
㉗
⑩
⑯
⑭
⑮
⑪
Ⓑ
⑰
⑥
㉘
⑫
⑱
⑲
⑬
㉒
㉑
㉓
⑳

**MODE Change Chart**

| Desired Mode / Current Mode | ▶<br>PLAY | ▶▶<br>FF | ◀◀<br>REW | ●<br>RECORD | ❚❚<br>PAUSE | ■<br>STOP | ⏏<br>EJECT |
|---|---|---|---|---|---|---|---|
| ▶<br>**PLAY** | — | PICTURE SEARCH (CUE) | PICTURE SEARCH (REVIEW) | — | PAUSE (PLAY) | STOP | EJECT |
| ▶▶<br>**FF** | PLAY | SKIP SCAN (CUE) | REW | — | — | STOP | EJECT |
| ◀◀<br>**REW** | PLAY | FF | SKIP SCAN (REVIEW) | — | — | STOP | EJECT |
| ●<br>**RECORD** | — | — | — | — | PAUSE (RECORD) | STOP | — |
| ⏩<br>**PICTURE SEARCH (CUE)** | — | | PICTURE SEARCH (REVIEW) | — | — | STOP | EJECT |
| ⏪<br>**PICTURE SEARCH (REVIEW)** | — | PICTURE SEARCH (CUE) | | — | — | STOP | EJECT |
| ❚❚<br>**PAUSE (PLAY)** | — | (*1)<br>PLAY | (*2)<br>PLAY | PAUSE (RECORD) | PLAY | STOP | EJECT |
| ❚❚<br>**PAUSE (RECORD)** | — | — | — | — | RECORD | STOP | — |
| ■<br>**STOP** | PLAY | F.FWD | REW | (*3)<br>(RECORD) | (*4)<br>PAUSE<br>blinking | — | EJECT |

(*1) PICTURE SEARCH (CUE) is set up while the button is being pressed.

(*2) PICTURE SEARCH (REVIEW) is set up while the button is being pressed.

(*3) EJECT MODE is set if the non-erase tab on the rear of the cassette has been removed.

(*4) When the RECORD button is pressed with the PAUSE lamp blinking, the unit enters the PAUSE (RECORD) mode.

When the PLAY and REW buttons are pressed at the same time, the unit automatically enters the PLAY mode at the completion of rewinding a tape.

# SL-C30E/C30UB
## RMT-216

SONY
# SERVICE MANUAL

*AEP Model*
*UK Model*
*E Model*
September, 1985

## SUPPLEMENT-1

This supplement updates the service manual to include production changes.
File this supplement with the service manual.

**Subject:**
The schematic diagram, printed wiring board, and electrical parts list in this supplement have been revised according to change of the last digits of the part number of SS-16 board from-13 to -15.

**Note:**
The SS-16 board whose last digits of the part number , is -14 is almost same as-15, the difference is the length of the lead wire.

MICROFILM

Consumer VIDEO

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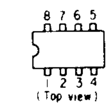
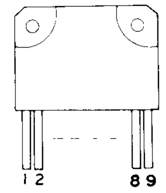
SEMICONDUCTORS

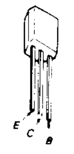
**BA4558**
**HA17558**
**NJM4558D**
**μPC358C**
**μPC4558C**


8 7 6 5
1 2 3 4
( Top view )

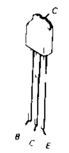
**M54543L**



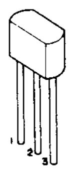
**2SA1048-GR**
**2SA1115**
**2SC2458**
**2SC2603**



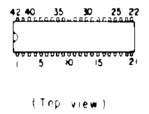
**2SD1164**



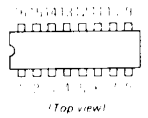
**M**



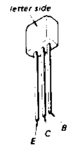
**CX194B-0**
**CX194B-5**


42 40 35 30 25 22
1 5 10 15 21
( Top view )

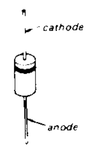
**MB84053B**
**TC4053BP**
**μPD4053BC**



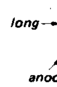
**2SA1175**
**2SC2785**


letter side
E C B

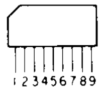
**10E-2**


cathode
anode

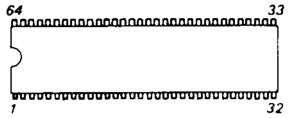
**TL**
**TL**



**LA7205**

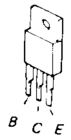


**MB88421-124M**

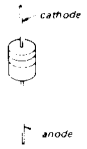


*(Top view)*

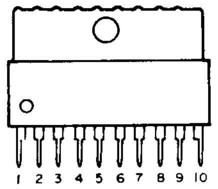
**2SC1061**
**2SD313HP**



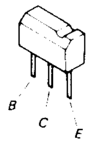
**1SS119**
**1SS148**


cathode
anode

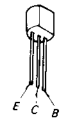
**LB1640N**


1 2 3 4 5 6 7 8 9 10

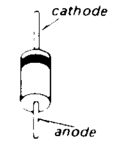
**2SA874**



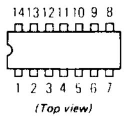
**2SC1474**
**2SC1475**
**2SD788**
**2SD789**



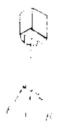
**1SS133**
**EQA02-06C**
**EQA01-06D**
**WQA02-06E**
**EQA02-10A**
**RD6.2E-B**
**RD10EB2**


cathode
anode

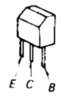
**LM324N**
**MB3614**
**NJM2902N**
**μPC324C**


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

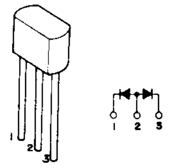
**2SA933S**
**2SA1309**
**2SC1740S**



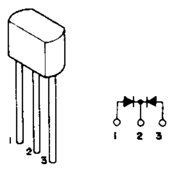
**2SD773**
**2SD774**



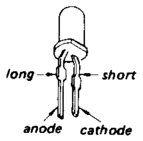
**MC911**



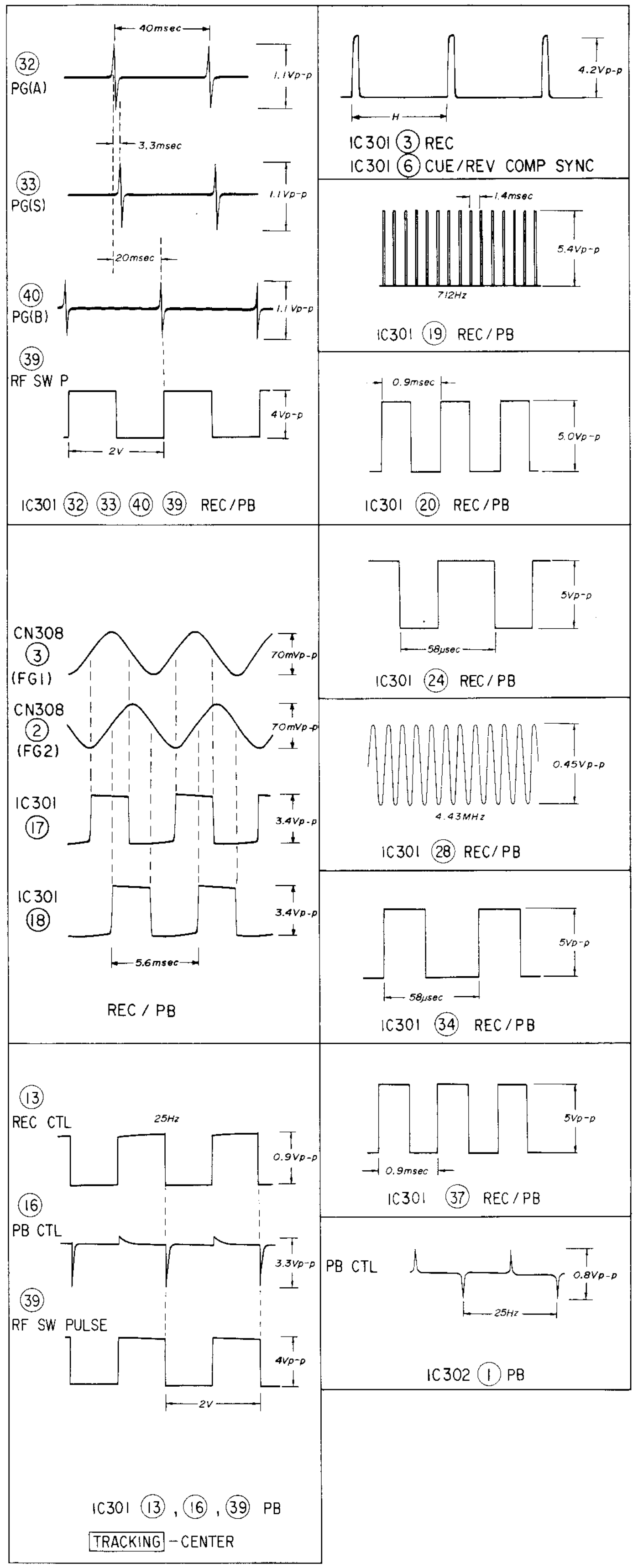
**MC921**



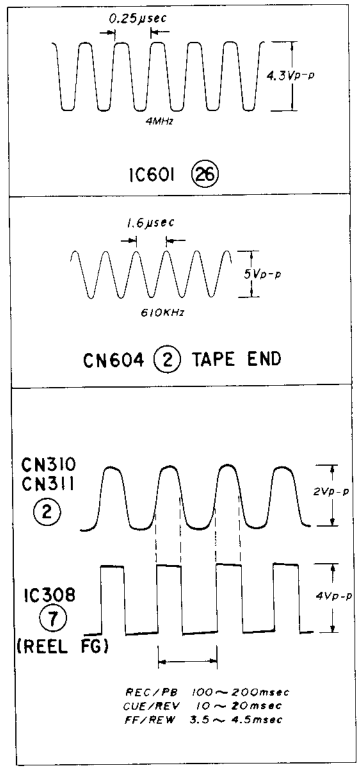
**TLR123**
**TLR124**


long
short
anode
cathode

## SS-16 (SERVO) BOARD

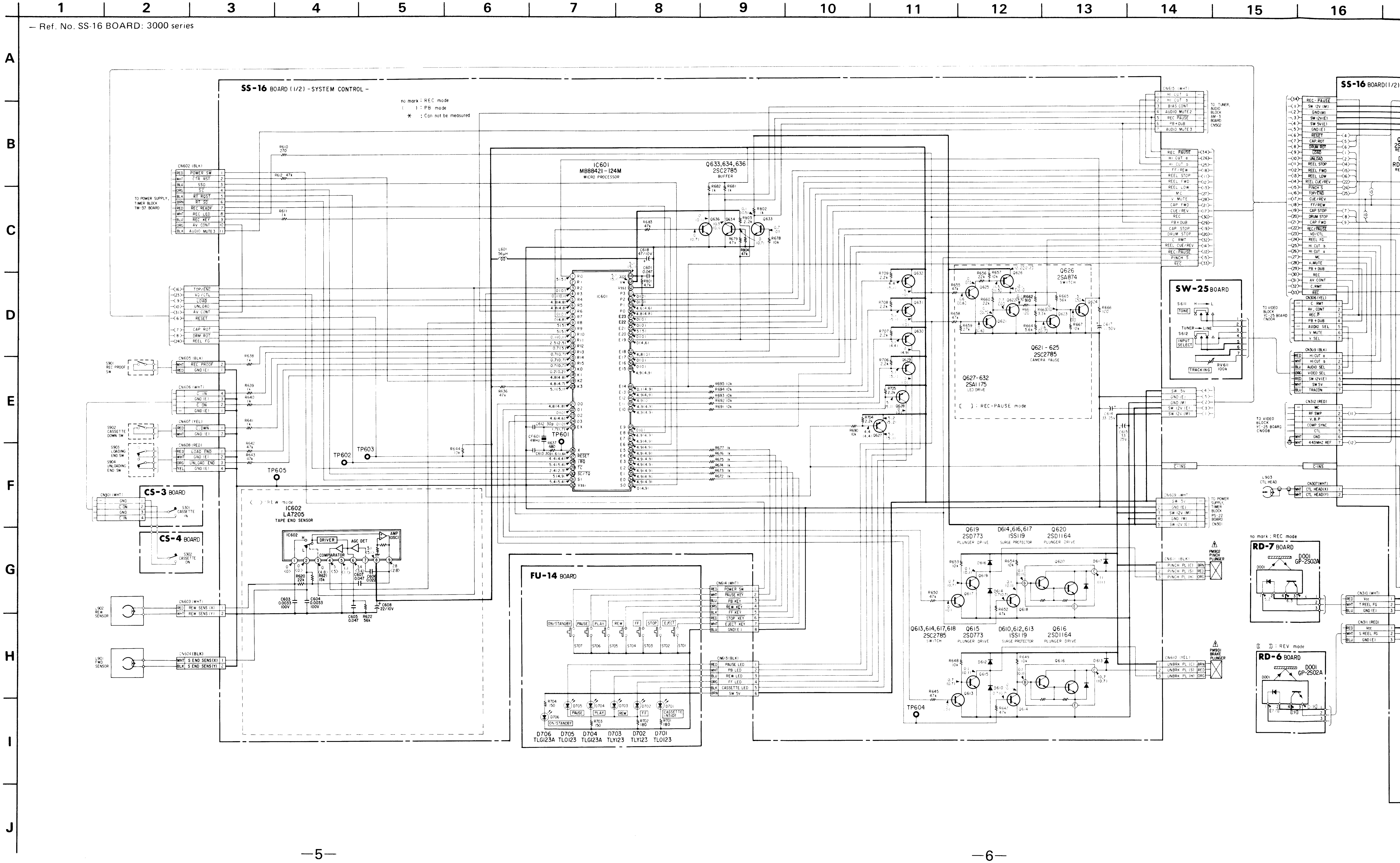


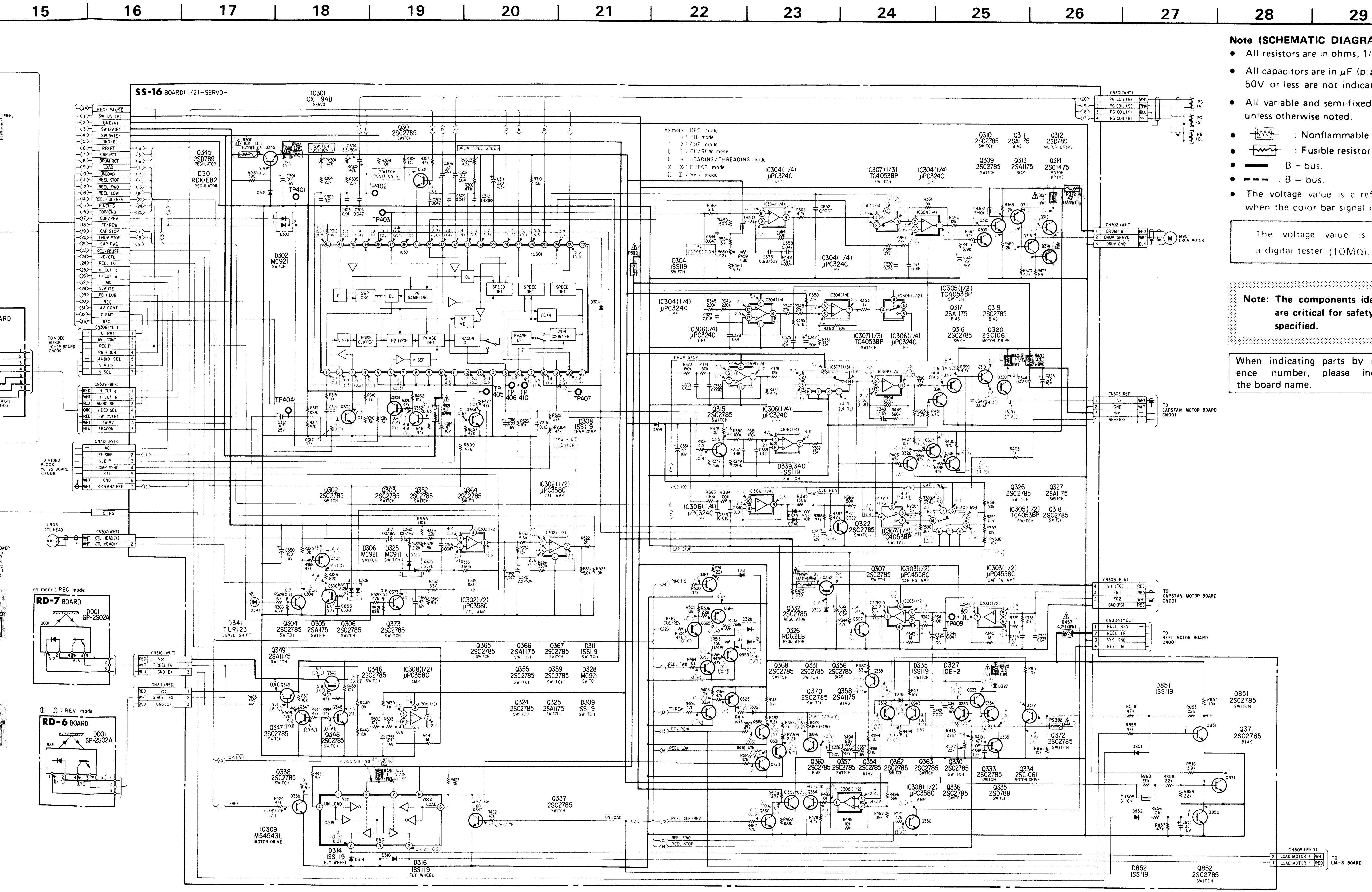
## SS-16 (SYSTEM CONTROL) BOARD



## SS-16 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

– Ref. No. SS-16 BOARD: 3000 series


SS-16 BOARD (1/2) - SYSTEM CONTROL -
no mark : REC mode
( ) : PB mode
* : Can not be measured
IC601
MB88421-124M
MICRO PROCESSOR
Q633,634,636
2SC2785
BUFFER
Q626
2SA874
SWITCH
Q621-625
2SC2785
CAMERA PAUSE
Q627-632
2SA1175
LED DRIVE
[ ] : REC·PAUSE mode
SW-25 BOARD
TRACKING
TO POWER SUPPLY, TIMER BLOCK TM-37 BOARD
TO TUNER, AUDIO BLOCK AM-3 BOARD CN502
TO VIDEO BLOCK YC-25 BOARD CN004
TO VIDEO BLOCK YC-25 BOARD CN008
TO POWER SUPPLY, TIMER BLOCK PS-22 BOARD CN002
TP601
TP602
TP603
TP604
TP605
CS-3 BOARD
CS-4 BOARD
IC602
LA7205
TAPE END SENSOR
( ) : REW mode
DRIVER
AGC DET
COMPARATOR
AMP (OSC)
FU-14 BOARD
ON/STANDBY
PAUSE
PLAY
REW
FF
STOP
EJECT
D706 TLG123A
D705 TLO123
D704 TLG123A
D703 TLY123
D702 TLY123
D701 TLO123
Q619 2SD773 PLUNGER DRIVE
D614,616,617 1SS119 SURGE PROTECTOR
Q620 2SD1164 PLUNGER DRIVE
Q613,614,617,618 2SC2785 SWITCH
Q615 2SD773 PLUNGER DRIVE
D610,612,613 1SS119 SURGE PROTECTOR
Q616 2SD1164 PLUNGER DRIVE
PM902 PINCH PLUNGER
PM901 BRAKE PLUNGER
L902 REW SENSOR
L901 FWD SENSOR
L903 CTL HEAD
no mark : REC mode
RD-7 BOARD
D001 GP-2S02A
[ ] : REV mode
RD-6 BOARD
D001 GP-2S02A
SS-16 BOARD (1/2)
S901 REC PROOF SW
S902 CASSETTE DOWN SW
S903 LOADING END SW
S904 UNLOADING END SW


15
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29
30
31
SS-16 BOARD(1/2)-SERVO-
IC301 CX-194B SERVO
Q301 2SC2785 SWITCH
Q345 2SD789 REGULATOR
D301 RD10EB2 REGULATOR
TP401
TP402
TP403
TP404
TP405
TP406
TP407
TP409
TP410
D302 MC921 SWITCH
D304 1SS119 SWITCH
IC304(1/4) μPC324C LPF
IC307(1/3) TC4053BP SWITCH
IC305(1/2) TC4053BP SWITCH
IC306(1/4) μPC324C LPF
Q310 2SC2785 SWITCH
Q311 2SA1175 BIAS
Q312 2SD789 MOTOR DRIVE
Q309 2SC2785 SWITCH
Q313 2SA1175 BIAS
Q314 2SC1475 MOTOR DRIVE
Q317 2SA1175 BIAS
Q319 2SC2785 BIAS
Q316 2SC2785 SWITCH
Q320 2SC1061 MOTOR DRIVE
Q315 2SC2785 SWITCH
D339,340 1SS119 SWITCH
D308 1SS119 TEMP COMP
Q302 2SC2785 SWITCH
Q303 2SC2785 SWITCH
Q352 2SC2785 SWITCH
Q364 2SC2785 SWITCH
IC302(1/2) μPC358C CTL AMP
Q326 2SC2785 SWITCH
Q327 2SA1175 SWITCH
IC305(1/2) TC4053BP SWITCH
Q318 2SC2785 SWITCH
Q322 2SC2785 SWITCH
D306 MC921 SWITCH
D325 MC911 SWITCH
D341 TLR123 LEVEL SHIFT
Q304 2SC2785 SWITCH
Q305 2SA1175 SWITCH
Q306 2SC2785 SWITCH
Q373 2SC2785 SWITCH
Q307 2SC2785 SWITCH
IC303(1/2) μPC4558C CAP FG AMP
Q332 2SC2785 REGULATOR
D326 RD6.2EB REGULATOR
Q365 2SC2785 SWITCH
Q366 2SA1175 SWITCH
Q367 2SC2785 SWITCH
D311 1SS119 SWITCH
Q349 2SA1175 SWITCH
Q346 2SC2785 SWITCH
IC308(1/2) μPC358C AMP
Q355 2SC2785 SWITCH
Q359 2SC2785 SWITCH
D328 MC921 SWITCH
Q324 2SC2785 SWITCH
Q325 2SA1175 SWITCH
D309 1SS119 SWITCH
Q347 2SC2785 SWITCH
Q348 2SC2785 SWITCH
Q368 2SC2785 SWITCH
Q331 2SC2785 SWITCH
Q356 2SA1175 BIAS
D335 1SS119 SWITCH
D327 10E-2
Q370 2SC2785 SWITCH
Q358 2SA1175 BIAS
D851 1SS119
Q851 2SC2785 SWITCH
Q371 2SC2785 BIAS
Q372 2SC2785 SWITCH
Q360 2SC2785 BIAS
Q357 2SC2785 SWITCH
Q354 2SA1175 BIAS
Q362 2SC2785 SWITCH
Q363 2SC2785 SWITCH
Q330 2SC2785 SWITCH
Q333 2SC2785 SWITCH
Q334 2SC1061 MOTOR DRIVE
Q338 2SC2785 SWITCH
Q337 2SC2785 SWITCH
IC309 M54543L MOTOR DRIVE
D314 1SS119 FLY WHEEL
D316 1SS119 FLY WHEEL
IC308(1/2) μPC358C AMP
Q336 2SC2785 SWITCH
Q335 2SD788 SWITCH
D852 1SS119
Q852 2SC2785 SWITCH
PS301
PS302
M901 DRUM MOTOR
CN301(WHT)
CN302(WHT)
CN303(RED)
CN304(YEL)
CN305(RED)
CN306(YEL)
CN307(WHT)
CN308(BLK)
CN309(BLK)
CN310(WHT)
CN311(RED)
CN312(RED)
TO CAPSTAN MOTOR BOARD CN001
TO REEL MOTOR BOARD CN001
TO LM-8 BOARD
TO VIDEO BLOCK YC-25 BOARD CN004
TO VIDEO BLOCK YC-25 BOARD CN008
L903 CTL HEAD
no mark : REC mode
RD-7 BOARD
D001 GP-2S02A
RD-6 BOARD
D001 GP-2S02A
[ ] : REV mode
no mark : REC mode
( ) : PB mode
< > : CUE mode
[ ] : FF/REW mode
(( )) : LOADING/THREADING mode
<< >> : EJECT mode
{ } : REV mode

**Note (SCHEMATIC DIAGRAMS):**

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : Nonflammable resistor
- ▭ : Fusible resistor
- ━━ : B + bus.
- - - - : B – bus.
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

The voltage value is measured using a digital tester (10MΩ).

**Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

When indicating parts by reference number, please include the board name.

## SS-16 (SERVO/SYSTEM CONTROL) PRINTED WIRING BOARD

**Note (PRINTED WIRING BOARDS):**

- ○– indicates a lead wire mounted on the component side.
- ●– indicates a lead wire mounted on the printed side.
- ▨ Soldering side
- ░ B + pattern.

– Ref. No. SS-16 BOARD: 3000 series –

TO CAPSTAN MOTOR BOARD CN1 <1> <9>

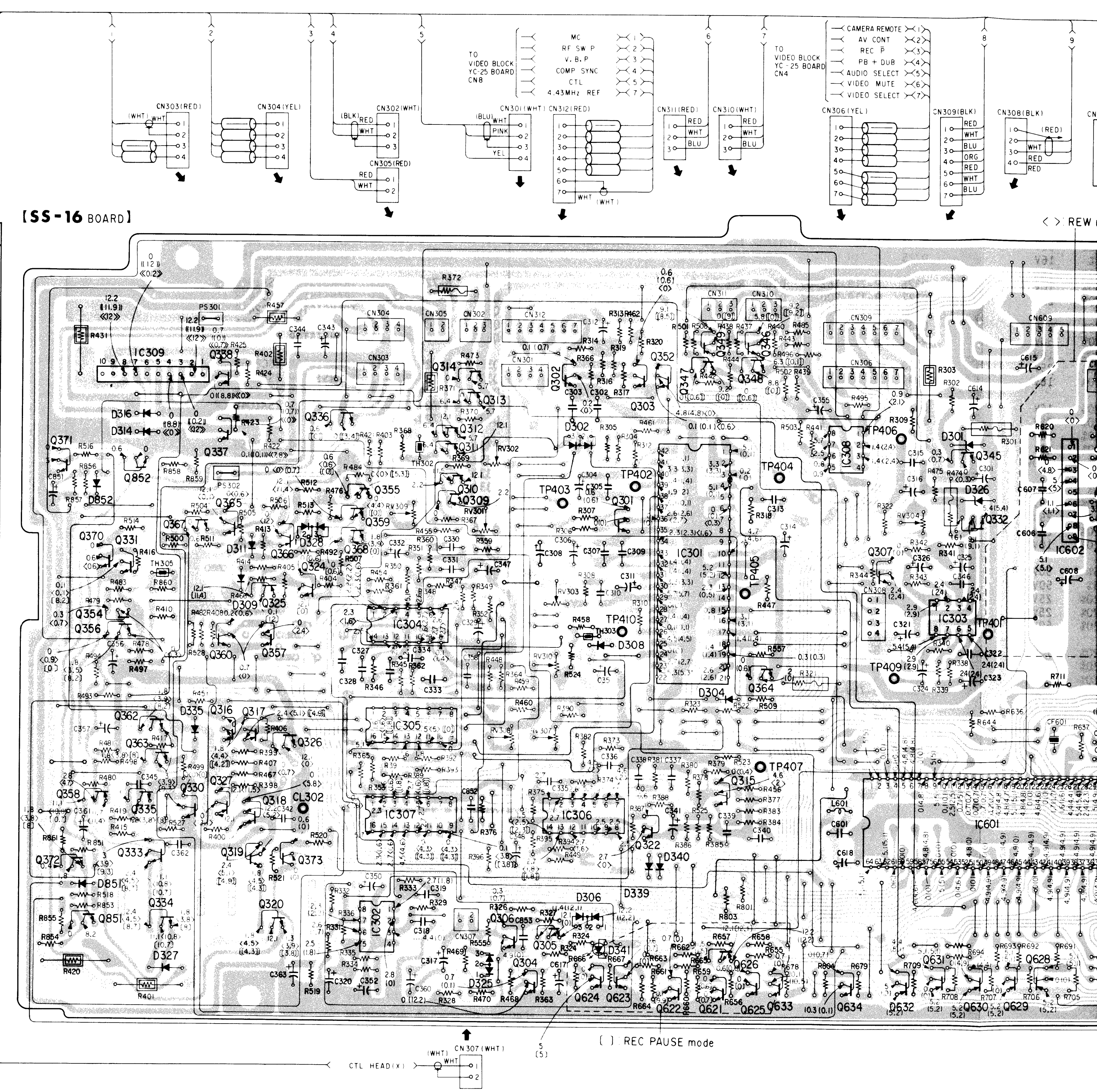
TO LM-8 BOARD <3>

TO DRUM MOTOR M901 <4> <5>

TO REEL MOTOR BOARD CN1 <2>

no mark: PB mode
< > : CUE mode
[ ] : FF/REW mode
(( )) : LOADING/THREADING mode
≪ ≫ : EJECT mode
[[ ]] : REV mode
* : can not be measured

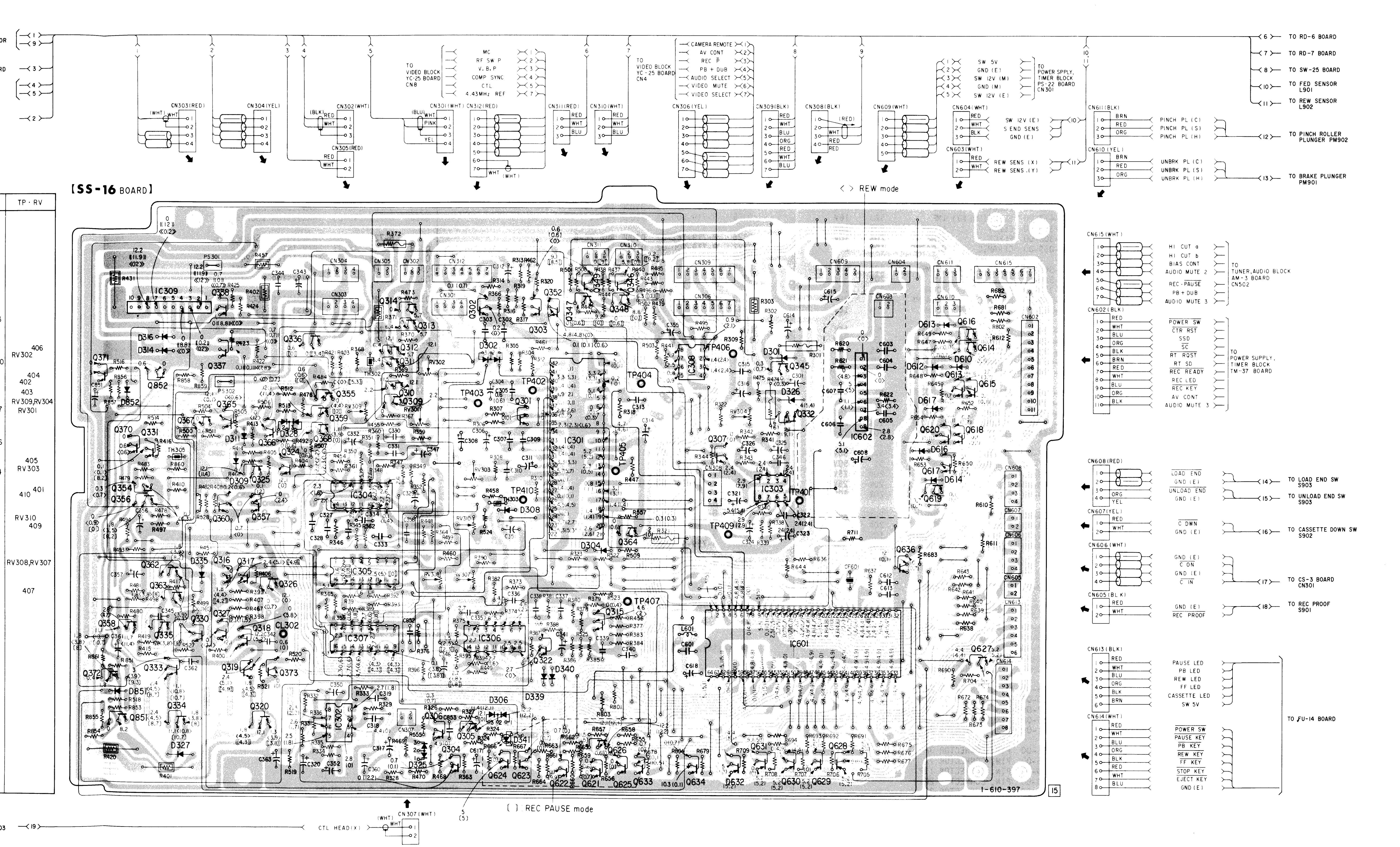
| Q · IC | D | TP · RV |
|---|---|---|
| 349,346 | | |
| IC309 338 302,303,352 347,348 | | |
| 314 | 613 | |
| 313 | 316 | |
| 337 616 | | |
| 336 614 | 301 | 406 |
| 312 | 314 302 | RV302 |
| 311,IC308,IC602 | 612,610 | |
| 371 852 345 615 | | 404 |
| 310 613 | | 402 |
| 355 309 332 | 852 326 | 403 |
| 359 | | RV309,RV304 |
| 367,365 301 | 617 | RV301 |
| 366 IC301 620 618 | | |
| 368 | 328 | |
| 370 307 617 | 311 616 | |
| 331 | | |
| 324 | | 405 |
| 325 IC303 | 309 614 | RV303 |
| 354 IC304 619 | | 410 401 |
| 356 357 | 308 | |
| 360 | | |
| | | RV310 |
| | | 409 |
| 364 | 304 | |
| | | RV308,RV307 |
| IC305 636 | 335 | |
| 362,316,317 | | |
| 326 | | 407 |
| 363 | | |
| 327 315 | | |
| IC307 IC306 IC601 | | |
| 358,335,330,318 | | |
| 322 | | |
| 627 | | |
| 333 319 373 | 339,340 | |
| 372 | | |
| | 851 | |
| 334 | 306 | |
| 851, 320 IC302 | | |
| | 341 | |
| 306,305 | | |
| 626 | 327 325 | |
| 624,623,631,630,629,628 | | |
| 304,622,621,625,633,634,632 | | |



1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I J
TO VIDEO BLOCK YC-25 BOARD CN8
MC
RF SW P
V. B. P
COMP SYNC
CTL
4.43MHz REF
TO VIDEO BLOCK YC-25 BOARD CN4
CAMERA REMOTE
AV CONT
REC P̄
PB + DUB
AUDIO SELECT
VIDEO MUTE
VIDEO SELECT
CN303(RED)
CN304(YEL)
CN302(WHT)
CN305(RED)
CN301(WHT)
CN312(RED)
CN311(RED)
CN310(WHT)
CN306(YEL)
CN309(BLK)
CN308(BLK)
[SS-16 BOARD]
< > : REW
IC309
IC301
IC303
IC304
IC305
IC306
IC307
IC302
IC308
IC601
IC602
TP402
TP403
TP404
TP405
TP406
TP407
TP409
TP410
CL302
[ ] REC PAUSE mode
CN307(WHT)
CTL HEAD(X)

TO CTL HEAD L903 <19>

NTED WIRING BOARD


4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
TO VIDEO BLOCK YC-25 BOARD CN8
MC
RF SW P
V. B. P
COMP SYNC
CTL
4.43MHz REF
TO VIDEO BLOCK YC-25 BOARD CN4
CAMERA REMOTE
AV CONT
REC P̄
PB + DUB
AUDIO SELECT
VIDEO MUTE
VIDEO SELECT
SW 5V
GND (E)
SW 12V (M)
GND (M)
SW 12V (E)
TO POWER SPPLY, TIMER BLOCK PS-22 BOARD CN301
TO RD-6 BOARD
TO RD-7 BOARD
TO SW-25 BOARD
TO FED SENSOR L901
TO REW SENSOR L902
CN303(RED)
CN304(YEL)
CN302(WHT)
CN305(RED)
CN301(WHT)
CN312(RED)
CN311(RED)
CN310(WHT)
CN306(YEL)
CN309(BLK)
CN308(BLK)
CN609(WHT)
CN604(WHT)
SW 12V (E)
S END SENS
GND (E)
CN603(WHT)
REW SENS (X)
REW SENS (Y)
CN611(BLK)
PINCH PL (C)
PINCH PL (S)
PINCH PL (H)
TO PINCH ROLLER PLUNGER PM902
CN610(YEL)
UNBRK PL (C)
UNBRK PL (S)
UNBRK PL (H)
TO BRAKE PLUNGER PM901
< > REW mode
[SS-16 BOARD]
TP·RV
CN615(WHT)
HI CUT a
HI CUT b
BIAS CONT
AUDIO MUTE 2
REC·PAUSE
PB + DUB
AUDIO MUTE 3
TO TUNER, AUDIO BLOCK AM-3 BOARD CN502
CN602(BLK)
POWER SW
CTR RST
SSD
SC
RT RQST
RT SD
REC READY
REC LED
REC KEY
AV CONT
AUDIO MUTE 3
TO POWER SUPPLY, TIMER BLOCK TM-37 BOARD
CN608(RED)
LOAD END
GND (E)
UNLOAD END
GND (E)
TO LOAD END SW S903
TO UNLOAD END SW S903
CN607(YEL)
C DWN
GND (E)
TO CASSETTE DOWN SW S902
CN606(WHT)
GND (E)
C ON
GND (E)
C IN
TO CS-3 BOARD CN301
CN605(BLK)
GND (E)
REC PROOF
TO REC PROOF S901
CN613(BLK)
PAUSE LED
PB LED
REW LED
FF LED
CASSETTE LED
SW 5V
CN614(WHT)
POWER SW
PAUSE KEY
PB KEY
REW KEY
FF KEY
STOP KEY
EJECT KEY
GND (E)
TO FU-14 BOARD
IC301
IC302
IC303
IC304
IC305
IC306
IC307
IC309
IC601
IC602
1-610-397
15
[ ] REC PAUSE mode
CN307(WHT)
CTL HEAD(X)

# ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF : μF, PF : μμF

COILS

- MMH : mH, UH : μH

| Ref.No | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| | *A-6715-187-A | SS-16 BOARD, COMPLETE<br>********************** | | | |
| | *3-681-170-00 | HEAT SINK, S | | | |
| | 7-621-770-87 | SCREW +B 2.6X5 | | | |

CAPACITOR

| Ref.No | Part No. | Description | | | Remark |
|---|---|---|---|---|---|
| C301 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C302 | 1-136-153-00 | MYLAR | 0.01MF | 10% | 50V |
| C303 | 1-136-153-00 | MYLAR | 0.01MF | 10% | 50V |
| C304 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C305 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C306 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C307 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C308 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C309 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C310 | 1-130-482-00 | MYLAR | 0.0082MF | 5% | 50V |
| C311 | 1-123-308-00 | ELECT | 220MF | 20% | 6.3V |
| C312 | 1-123-369-00 | ELECT | 4.7MF | 20% | 25V |
| C313 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C314 | 1-123-306-00 | ELECT | 47MF | 20% | 10V |
| C315 | 1-108-605-00 | MYLAR | 0.12MF | 5% | 50V |
| C316 | 1-127-468-00 | ELECT(SOLID) | 0.22MF | 5% | 16V |
| C317 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C318 | 1-130-479-00 | MYLAR | 0.0047MF | 5% | 50V |
| C319 | 1-102-106-00 | CERAMIC | 100PF | 10% | 50V |
| C320 | 1-123-381-00 | ELECT | 2.2MF | 20% | 50V |
| C321 | 1-123-308-00 | ELECT | 220MF | 20% | 6.3V |
| C322 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C323 | 1-131-357-00 | TANTALUM | 4.7MF | 20% | 25V |
| C324 | 1-123-381-00 | ELECT | 2.2MF | 20% | 50V |
| C325 | 1-131-357-00 | TANTALUM | 4.7MF | 20% | 25V |
| C326 | 1-123-381-00 | ELECT | 2.2MF | 20% | 50V |
| C327 | 1-161-054-00 | CERAMIC | 0.018MF | 10% | 25V |
| C328 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C329 | 1-123-356-00 | ELECT | 10MF | 20% | 16V |
| C330 | 1-161-054-00 | CERAMIC | 0.018MF | 10% | 25V |
| C331 | 1-161-054-00 | CERAMIC | 0.018MF | 10% | 25V |
| C332 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C333 | 1-124-429-00 | ELECT | 0.68MF | 20% | 50V |
| C334 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C335 | 1-161-055-00 | CERAMIC | 0.022MF | 10% | 25V |
| C336 | 1-161-040-00 | CERAMIC | 0.0012MF | 10% | 25V |
| C337 | 1-161-054-00 | CERAMIC | 0.018MF | 10% | 25V |
| C338 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C339 | 1-161-054-00 | CERAMIC | 0.018MF | 10% | 25V |
| C340 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C341 | 1-123-382-00 | ELECT | 3.3MF | 20% | 50V |
| C342 | 1-161-057-00 | CERAMIC | 0.033MF | 10% | 25V |
| C343 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C344 | 1-161-057-00 | CERAMIC | 0.033MF | 10% | 25V |
| C345 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C346 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C347 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C348 | 1-127-472-00 | ELECT(SOLID) | 1MF | 5% | 16V |
| C350 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C351 | 1-123-306-00 | ELECT | 47MF | 20% | 10V |
| C352 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C355 | 1-123-369-00 | ELECT | 4.7MF | 20% | 25V |
| C356 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C357 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C358 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C360 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C361 | 1-123-333-00 | ELECT | 100MF | 20% | 16V |
| C362 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C363 | 1-123-332-00 | ELECT | 47MF | 20% | 16V |
| C601 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C603 | 1-129-794-00 | FILM | 0.0033MF | 5% | 100V |
| C604 | 1-129-794-00 | FILM | 0.0033MF | 5% | 100V |
| C605 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C606 | 1-161-055-00 | CERAMIC | 0.022MF | 10% | 25V |
| C607 | 1-161-059-00 | CERAMIC | 0.047MF | 10% | 25V |
| C608 | 1-123-644-00 | ELECT | 22MF | 20% | 10V |
| C612 | 1-102-517-00 | CERAMIC | 30PF | 5% | 50V |
| C613 | 1-102-517-00 | CERAMIC | 30PF | 5% | 50V |
| C614 | 1-123-343-00 | ELECT | 33MF | 20% | 25V |
| C615 | 1-123-343-00 | ELECT | 33MF | 20% | 25V |
| C617 | 1-123-380-00 | ELECT | 1MF | 20% | 50V |
| C618 | 1-123-306-00 | ELECT | 47MF | 20% | 10V |
| C851 | 1-123-318-00 | ELECT | 33MF | 20% | 10V |
| C852 | 1-102-125-00 | CERAMIC | 0.0047MF | 10% | 50V |
| C853 | 1-102-074-00 | CERAMIC | 0.001MF | 10% | 50V |

FILTER

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| CF601 | 1-527-822-00 | OSCILLATOR, CERAMIC | |

CONNECTOR

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| CN301 | *1-560-892-00 | PIN, CONNECTOR 4P | |
| CN302 | *1-560-466-00 | PIN, CONNECTOR 3P | |
| CN303 | *1-560-892-00 | PIN, CONNECTOR 4P | |
| CN304 | *1-560-892-00 | PIN, CONNECTOR 4P | |
| CN305 | *1-560-890-00 | PIN, CONNECTOR 2P | |
| CN306 | *1-560-895-00 | PIN, CONNECTOR 7P | |
| CN307 | *1-560-890-00 | PIN, CONNECTOR 2P | |
| CN308 | *1-560-892-00 | PIN, CONNECTOR 4P | |
| CN309 | *1-560-895-00 | PIN, CONNECTOR 7P | |
| CN310 | *1-560-891-00 | PIN, CONNECTOR 3P | |
| CN311 | *1-560-891-00 | PIN, CONNECTOR 3P | |
| CN312 | *1-560-895-00 | PIN, CONNECTOR 7P | |
| CN602 | *1-560-899-00 | PIN, CONNECTOR 11P | |
| CN603 | *1-560-890-00 | PIN, CONNECTOR 2P | |
| CN604 | *1-560-890-00 | PIN, CONNECTOR 2P | |
| CN605 | *1-560-890-00 | PIN, CONNECTOR 2P | |
| CN606 | *1-560-892-00 | PIN, CONNECTOR 4P | |
| CN607 | *1-560-890-00 | PIN, CONNECTOR 2P | |
| CN608 | *1-560-892-00 | PIN, CONNECTOR 4P | |

## SS-16

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| CN609 | *1-560-893-00 | PIN, CONNECTOR 5P | |
| CN610 | *1-560-891-00 | PIN, CONNECTOR 3P | |
| CN611 | *1-560-891-00 | PIN, CONNECTOR 3P | |
| CN613 | *1-560-894-00 | PIN, CONNECTOR 6P | |
| CN614 | *1-560-896-00 | PIN, CONNECTOR 8P | |
| CN615 | *1-560-895-00 | PIN, CONNECTOR 7P | |

DIODE

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| D301 | 8-719-100-57 | DIODE RD10EB2 | |
| D302 | 8-719-000-06 | DIODE MC921 | |
| D304 | 8-719-911-19 | DIODE 1SS119 | |
| D306 | 8-719-000-06 | DIODE MC921 | |
| D308 | 8-719-911-19 | DIODE 1SS119 | |
| D309 | 8-719-911-19 | DIODE 1SS119 | |
| D311 | 8-719-911-19 | DIODE 1SS119 | |
| D314 | 8-719-911-19 | DIODE 1SS119 | |
| D316 | 8-719-911-19 | DIODE 1SS119 | |
| D325 | 8-719-000-04 | DIODE MC911 | |
| D326 | 8-719-162-07 | DIODE RD6.2E-B | |
| D327 | 8-719-200-02 | DIODE 10E-2 | |
| D328 | 8-719-000-06 | DIODE MC921 | |
| D335 | 8-719-911-19 | DIODE 1SS119 | |
| D339 | 8-719-911-19 | DIODE 1SS119 | |
| D340 | 8-719-911-19 | DIODE 1SS119 | |
| D341 | 8-719-812-31 | DIODE TLR123 | |
| D610 | 8-719-911-19 | DIODE 1SS119 | |
| D612 | 8-719-911-19 | DIODE 1SS119 | |
| D613 | 8-719-911-19 | DIODE 1SS119 | |
| D614 | 8-719-911-19 | DIODE 1SS119 | |
| D616 | 8-719-911-19 | DIODE 1SS119 | |
| D617 | 8-719-911-19 | DIODE 1SS119 | |
| D851 | 8-719-911-19 | DIODE 1SS119 | |
| D852 | 8-719-911-19 | DIODE 1SS119 | |

IC

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| IC301 | 8-751-941-05 | IC CX-194B-5 | |
| IC302 | 8-759-135-80 | IC UPC358C | |
| IC303 | 8-759-145-58 | IC UPC4558C | |
| IC304 | 8-759-132-40 | IC UPC324C | |
| IC305 | 8-759-240-53 | IC TC4053BP | |
| IC306 | 8-759-132-40 | IC UPC324C | |
| IC307 | 8-759-240-53 | IC TC4053BP | |
| IC308 | 8-759-135-80 | IC UPC358C | |
| IC309 | 8-759-600-24 | IC M54543L | |
| IC601 | 8-759-910-58 | IC MB88421-124M | |
| IC602 | 8-759-800-72 | IC LA7205 | |

COIL

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| L601 | 1-408-418-00 | MICRO INDUCTOR 56UH | |

IC LINK

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| PS301⚠ | 1-532-637-00 | LINK, IC | |
| PS302⚠ | 1-532-679-00 | LINK, IC | |

TRANSISTOR

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| Q301 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q302 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q303 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q304 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q305 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q306 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q307 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q309 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q310 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q311 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q312 | 8-729-177-43 | TRANSISTOR 2SD774 | |
| Q313 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q314 ⚠ | 8-729-805-13 | TRANSISTOR 2SC1475-13 | |
| Q315 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q316 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q317 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q318 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q319 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q320 | 8-729-316-16 | TRANSISTOR 2SC1061 | |
| Q322 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q324 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q325 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q326 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q327 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q330 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q331 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q332 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q333 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q334 | 8-729-316-16 | TRANSISTOR 2SC1061 | |
| Q335 | 8-729-177-32 | TRANSISTOR 2SD773 | |
| Q336 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q337 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q338 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q345 | 8-729-245-83 | TRANSISTOR 2SD774 | |
| Q346 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q347 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q348 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q349 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q352 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q354 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q355 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q356 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q357 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q358 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q359 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q360 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q362 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q363 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q364 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q365 | 8-729-245-83 | TRANSISTOR 2SC2458 | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

## SS-1

| Ref.No | Part |
|---|---|
| Q366 | 8-729 |
| Q367 | 8-729 |
| Q368 | 8-729 |
| Q370 | 8-729 |
| Q371 | 8-729 |
| Q372 | 8-729 |
| Q373 | 8-729 |
| Q613 | 8-729 |
| Q614 | 8-729 |
| Q615 | 8-729 |
| Q616 | 8-729 |
| Q617 | 8-729 |
| Q618 | 8-729 |
| Q619 | 8-729 |
| Q620 | 8-729 |
| Q621 | 8-729 |
| Q622 | 8-729 |
| Q623 | 8-729 |
| Q624 | 8-729 |
| Q625 | 8-729 |
| Q626 | 8-729 |
| Q627 | 8-729 |
| Q628 | 8-729 |
| Q629 | 8-729 |
| Q630 | 8-729 |
| Q631 | 8-729 |
| Q632 | 8-729 |
| Q633 | 8-729 |
| Q634 | 8-729 |
| Q636 | 8-729 |
| Q851 | 8-729 |
| Q852 | 8-729 |
| R301 ⚠ | 1-21 |
| R302 | 1-247 |
| R303 ⚠ | 1-20 |
| R304 | 1-247 |
| R305 | 1-247 |
| R306 | 1-249 |
| R307 | 1-249 |
| R308 | 1-249 |
| R309 | 1-249 |
| R310 | 1-247 |
| R312 | 1-247 |
| R313 | 1-247 |
| R314 | 1-249 |
| R315 | 1-247 |
| R316 | 1-247 |
| R317 | 1-249 |
| R318 | 1-247 |
| R319 | 1-247 |
| R320 | 1-249 |

ot stocked
quired for
should be
hese items.

| | Remark |
|---|---|
| 0% | 50V |
| % | 16V |
| 0% | 16V |
| 0% | 10V |
| 0% | 25V |
| 0% | 25V |
| 0% | 50V |
| 0% | 16V |
| 0% | 25V |
| 0% | 16V |
| 0% | 16V |
| 0% | 25V |
| 0% | 16V |
| 0% | 25V |
| % | 100V |
| % | 100V |
| 0% | 25V |
| 0% | 25V |
| 0% | 25V |
| 0% | 10V |
| % | 50V |
| % | 50V |
| 0% | 25V |
| 0% | 25V |
| 0% | 50V |
| 0% | 10V |
| 0% | 10V |
| 0% | 50V |
| 0% | 50V |

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| CN609 | *1-560-893-00 | PIN, CONNECTOR 5P | |
| CN610 | *1-560-891-00 | PIN, CONNECTOR 3P | |
| CN611 | *1-560-891-00 | PIN, CONNECTOR 3P | |
| CN613 | *1-560-894-00 | PIN, CONNECTOR 6P | |
| CN614 | *1-560-896-00 | PIN, CONNECTOR 8P | |
| CN615 | *1-560-895-00 | PIN, CONNECTOR 7P | |

DIODE

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| D301 | 8-719-100-57 | DIODE RD10EB2 | |
| D302 | 8-719-000-06 | DIODE MC921 | |
| D304 | 8-719-911-19 | DIODE 1SS119 | |
| D306 | 8-719-000-06 | DIODE MC921 | |
| D308 | 8-719-911-19 | DIODE 1SS119 | |
| D309 | 8-719-911-19 | DIODE 1SS119 | |
| D311 | 8-719-911-19 | DIODE 1SS119 | |
| D314 | 8-719-911-19 | DIODE 1SS119 | |
| D316 | 8-719-911-19 | DIODE 1SS119 | |
| D325 | 8-719-000-04 | DIODE MC911 | |
| D326 | 8-719-162-07 | DIODE RD6.2E-B | |
| D327 | 8-719-200-02 | DIODE 10E-2 | |
| D328 | 8-719-000-06 | DIODE MC921 | |
| D335 | 8-719-911-19 | DIODE 1SS119 | |
| D339 | 8-719-911-19 | DIODE 1SS119 | |
| D340 | 8-719-911-19 | DIODE 1SS119 | |
| D341 | 8-719-812-31 | DIODE TLR123 | |
| D610 | 8-719-911-19 | DIODE 1SS119 | |
| D612 | 8-719-911-19 | DIODE 1SS119 | |
| D613 | 8-719-911-19 | DIODE 1SS119 | |
| D614 | 8-719-911-19 | DIODE 1SS119 | |
| D616 | 8-719-911-19 | DIODE 1SS119 | |
| D617 | 8-719-911-19 | DIODE 1SS119 | |
| D851 | 8-719-911-19 | DIODE 1SS119 | |
| D852 | 8-719-911-19 | DIODE 1SS119 | |

IC

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| IC301 | 8-751-941-05 | IC CX-194B-5 | |
| IC302 | 8-759-135-80 | IC UPC358C | |
| IC303 | 8-759-145-58 | IC UPC4558C | |
| IC304 | 8-759-132-40 | IC UPC324C | |
| IC305 | 8-759-240-53 | IC TC4053BP | |
| IC306 | 8-759-132-40 | IC UPC324C | |
| IC307 | 8-759-240-53 | IC TC4053BP | |
| IC308 | 8-759-135-80 | IC UPC358C | |
| IC309 | 8-759-600-24 | IC M54543L | |
| IC601 | 8-759-910-58 | IC MB88421-124M | |
| IC602 | 8-759-800-72 | IC LA7205 | |

COIL

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| L601 | 1-408-418-00 | MICRO INDUCTOR 56UH | |

IC LINK

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| PS301 | ⚠1-532-637-00 | LINK, IC | |
| PS302 | ⚠1-532-679-00 | LINK, IC | |

TRANSISTOR

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| Q301 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q302 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q303 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q304 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q305 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q306 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q307 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q309 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q310 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q311 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q312 | 8-729-177-43 | TRANSISTOR 2SD774 | |
| Q313 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q314 | ⚠8-729-805-13 | TRANSISTOR 2SC1475-13 | |
| Q315 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q316 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q317 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q318 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q319 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q320 | 8-729-316-16 | TRANSISTOR 2SC1061 | |
| Q322 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q324 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q325 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q326 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q327 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q330 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q331 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q332 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q333 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q334 | 8-729-316-16 | TRANSISTOR 2SC1061 | |
| Q335 | 8-729-177-32 | TRANSISTOR 2SD773 | |
| Q336 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q337 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q338 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q345 | 8-729-245-83 | TRANSISTOR 2SD774 | |
| Q346 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q347 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q348 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q349 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q352 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q354 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q355 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q356 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q357 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q358 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q359 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q360 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q362 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q363 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q364 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q365 | 8-729-245-83 | TRANSISTOR 2SC2458 | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

| Ref.No | Part No. | Description | Remark |
|---|---|---|---|
| Q366 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q367 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q368 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q370 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q371 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q372 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q373 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q613 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q614 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q615 | 8-729-177-43 | TRANSISTOR 2SD774 | |
| Q616 | 8-729-116-42 | TRANSISTOR 2SD1164 | |
| Q617 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q618 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q619 | 8-729-177-43 | TRANSISTOR 2SD774 | |
| Q620 | 8-729-116-42 | TRANSISTOR 2SD1164 | |
| Q621 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q622 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q623 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q624 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q625 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q626 | 8-729-987-42 | TRANSISTOR 2SA874 | |
| Q627 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q628 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q629 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q630 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q631 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q632 | 8-729-204-83 | TRANSISTOR 2SA1048-GR | |
| Q633 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q634 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q636 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q851 | 8-729-245-83 | TRANSISTOR 2SC2458 | |
| Q852 | 8-729-245-83 | TRANSISTOR 2SC2458 | |

RESISTOR

| Ref.No | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R301 | ⚠1-212-855-00 | FUSIBLE | 8.2 | 5% | 1/4W | F |
| R302 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R303 | ⚠1-206-482-00 | METAL OXIDE | 62 | 5% | 2W | F |
| R304 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R305 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R306 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R307 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R308 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R309 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R310 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R312 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R313 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R314 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R315 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R316 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R317 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R318 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R319 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R320 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R321 | ⚠1-212-850-00 | FUSIBLE | 5.1 | 5% | 1/4W | F |
| R322 | 1-249-434-11 | CARBON | 27K | 5% | 1/6W | |
| R323 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R324 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R325 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R326 | 1-247-829-00 | CARBON | 820 | 5% | 1/6W | |
| R327 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R328 | 1-249-419-11 | CARBON | 1.5K | 5% | 1/6W | |
| R329 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R331 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R332 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R333 | 1-247-891-00 | CARBON | 330K | 5% | 1/6W | |
| R334 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R335 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R336 | 1-247-891-00 | CARBON | 330K | 5% | 1/6W | |
| R338 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R339 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R340 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R341 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R342 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R343 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R344 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R345 | 1-247-887-00 | CARBON | 220K | 5% | 1/6W | |
| R346 | 1-247-887-00 | CARBON | 220K | 5% | 1/6W | |
| R347 | 1-249-434-11 | CARBON | 27K | 5% | 1/6W | |
| R348 | 1-249-434-11 | CARBON | 27K | 5% | 1/6W | |
| R349 | 1-247-848-00 | CARBON | 5.1K | 5% | 1/6W | |
| R350 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R351 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R352 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R353 | 1-247-856-00 | CARBON | 11K | 5% | 1/6W | |
| R359 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R360 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R361 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R362 | 1-247-872-00 | CARBON | 51K | 5% | 1/6W | |
| R363 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R364 | 1-247-900-00 | CARBON | 750K | 5% | 1/6W | |
| R365 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R367 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R368 | 1-247-833-00 | CARBON | 1.2K | 5% | 1/6W | |
| R369 | 1-247-838-00 | CARBON | 2K | 5% | 1/6W | |
| R370 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R371 | ⚠1-212-360-00 | METAL OXIDE | 1 | 5% | 1W | F |
| R372 | ⚠1-212-849-00 | FUSIBLE | 4.7 | 5% | 1/4W | F |
| R373 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R374 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R375 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R376 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R377 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R378 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R379 | 1-247-887-00 | CARBON | 220K | 5% | 1/6W | |
| R380 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R381 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

| Ref.No | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R382 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R383 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R384 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R385 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R386 | 1-247-883-00 | CARBON | 150K | 5% | 1/6W | |
| R387 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R388 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R389 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R390 | 1-247-868-00 | CARBON | 36K | 5% | 1/6W | |
| R391 | 1-247-866-00 | CARBON | 30K | 5% | 1/6W | |
| R392 | 1-247-832-00 | CARBON | 1.1K | 5% | 1/6W | |
| R393 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R394 | 1-247-897-00 | CARBON | 560K | 5% | 1/6W | |
| R395 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R396 | 1-247-867-00 | CARBON | 33K | 5% | 1/6W | |
| R398 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R399 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R400 | 1-247-823-00 | CARBON | 470 | 5% | 1/6W | |
| R401 | ⚠ 1-212-360-00 | METAL OXIDE | 1 | 5% | 1W | F |
| R402 | ⚠ 1-246-981-00 | CARBON | 4.7 | 5% | 1/8W | F |
| R403 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R404 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R405 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R406 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R407 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R408 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R410 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R413 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R414 | 1-247-850-00 | CARBON | 6.2K | 5% | 1/6W | |
| R415 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R416 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R417 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R419 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R420 | ⚠ 1-212-366-00 | METAL OXIDE | 3.3 | 5% | 1W | F |
| R421 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R422 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R423 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R424 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R425 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R431 | ⚠ 1-212-360-00 | METAL OXIDE | 1 | 5% | 1W | F |
| R437 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R438 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R439 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R440 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R441 | 1-247-903-00 | CARBON | 1M | 5% | 1/6W | |
| R442 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R443 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R444 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R448 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R449 | 1-247-897-00 | CARBON | 560K | 5% | 1/6W | |
| R451 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R454 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |
| R455 | 1-247-845-00 | CARBON | 3.9K | 5% | 1/6W | |
| R456 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R457 | ⚠ 1-246-981-00 | CARBON | 4.7 | 5% | 1/8W | F |
| R458 | 1-247-825-00 | CARBON | 560 | 5% | 1/6W | |
| R459 | 1-247-837-00 | CARBON | 1.8K | 5% | 1/6W | |
| R460 | 1-247-843-00 | CARBON | 3.3K | 5% | 1/6W | |
| R461 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R462 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R466 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R467 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R468 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R469 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R470 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R473 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R474 | ⚠ 1-212-857-00 | FUSIBLE | 10 | 5% | 1/4W | F |
| R475 | 1-247-819-00 | CARBON | 330 | 5% | 1/6W | |
| R476 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R477 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R478 | 1-247-127-00 | CARBON | 680 | 5% | 1/4W | |
| R479 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R480 | 1-247-795-00 | CARBON | 33 | 5% | 1/6W | |
| R481 | 1-247-808-00 | CARBON | 110 | 5% | 1/6W | |
| R482 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R483 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R484 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R485 | 1-247-821-00 | CARBON | 390 | 5% | 1/6W | |
| R492 | 1-247-853-00 | CARBON | 8.2K | 5% | 1/6W | |
| R493 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R494 | 1-247-875-00 | CARBON | 68K | 5% | 1/6W | |
| R495 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R496 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R497 | 1-247-869-00 | CARBON | 39K | 5% | 1/6W | |
| R498 | 1-247-808-00 | CARBON | 110 | 5% | 1/6W | |
| R499 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R500 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R501 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R502 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R503 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R504 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R505 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R506 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R507 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R508 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R509 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R511 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R512 | 1-247-125-00 | CARBON | 560 | 5% | 1/4W | |
| R513 | 1-247-128-00 | CARBON | 750 | 5% | 1/4W | |
| R514 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R516 | 1-247-845-00 | CARBON | 3.9K | 5% | 1/6W | |
| R518 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R519 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R520 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R521 | 1-247-879-00 | CARBON | 100K | 5% | 1/6W | |
| R522 | 1-247-857-00 | CARBON | 12K | 5% | 1/6W | |

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

# SL-C30E/C30UB
## RMT-216

## SS-16

| Ref.No | Part No. | Description | | | | Remark |
|---|---|---|---|---|---|---|
| R523 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R524 | 1-247-842-00 | CARBON | 3K | 5% | 1/6W | |
| R525 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R527 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R528 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R555 | 1-247-880-00 | CARBON | 110K | 5% | 1/6W | |
| R557 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R610 | 1-247-817-00 | CARBON | 270 | 5% | 1/6W | |
| R611 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R612 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R620 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R621 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |
| R622 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R636 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R637 | 1-247-827-00 | CARBON | 680 | 5% | 1/6W | |
| R638 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R639 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R640 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R641 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R642 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R643 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R644 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R645 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R647 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R648 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R649 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R650 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R652 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R653 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R654 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R655 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R656 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R657 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R658 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R659 | 1-249-434-11 | CARBON | 27K | 5% | 1/6W | |
| R660 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R661 | 1-247-809-00 | CARBON | 120 | 5% | 1/6W | |
| R662 | 1-247-830-00 | CARBON | 910 | 5% | 1/6W | |
| R663 | 1-247-842-00 | CARBON | 3K | 5% | 1/6W | |
| R664 | 1-247-849-00 | CARBON | 5.6K | 5% | 1/6W | |
| R665 | 1-247-873-00 | CARBON | 56K | 5% | 1/6W | |
| R666 | 1-247-807-00 | CARBON | 100 | 5% | 1/6W | |
| R667 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R672 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R673 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R674 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R675 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R676 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R677 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R678 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R679 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R681 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R682 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R683 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R690 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R691 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R692 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R693 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R694 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R695 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R704 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R705 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R706 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R707 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R708 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R709 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R801 | 1-247-847-00 | CARBON | 4.7K | 5% | 1/6W | |
| R802 | 1-247-831-00 | CARBON | 1K | 5% | 1/6W | |
| R803 | 1-247-839-00 | CARBON | 2.2K | 5% | 1/6W | |
| R804 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R851 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R853 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R854 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R855 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R856 | 1-249-429-11 | CARBON | 10K | 5% | 1/6W | |
| R857 | 1-249-437-11 | CARBON | 47K | 5% | 1/6W | |
| R858 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R859 | 1-247-863-00 | CARBON | 22K | 5% | 1/6W | |
| R860 | 1-249-434-11 | CARBON | 27K | 5% | 1/6W | |
| R861 | 1-247-859-00 | CARBON | 15K | 5% | 1/6W | |

### VARIABLE RESISTOR

| | | |
|---|---|---|
| RV301 | 1-228-996-00 | RES, ADJ, CARBON 47K |
| RV302 | 1-228-996-00 | RES, ADJ, CARBON 47K |
| RV303 | 1-224-254-XX | RES, ADJ, METAL GLAZE 47K |
| RV304 | 1-228-996-00 | RES, ADJ, CARBON 47K |
| RV307 | 1-228-994-00 | RES, ADJ, METAL GLAZE 10K |
| RV308 | 1-228-994-00 | RES, ADJ, METAL GLAZE 10K |
| RV309 | 1-228-991-00 | RES, ADJ, METAL GLAZE 2.2K |
| RV310 | 1-228-991-00 | RES, ADJ, METAL GLAZE 2.2K |

### THERMISTOR

| | | |
|---|---|---|
| TH302 | 1-800-202-XX | THERMISTOR S-10K |
| TH303 | 1-800-200-00 | THERMISTOR S-3K |
| TH305 | 1-800-202-XX | THERMISTOR S-10K |

******************************************************************

When indicating parts by reference number, please include the board name.

English
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Sony Corporation

# SL-C30E/C30UB
## RMT-216

**SONY**
# SERVICE MANUAL
# ADJUSTMENT MANUAL

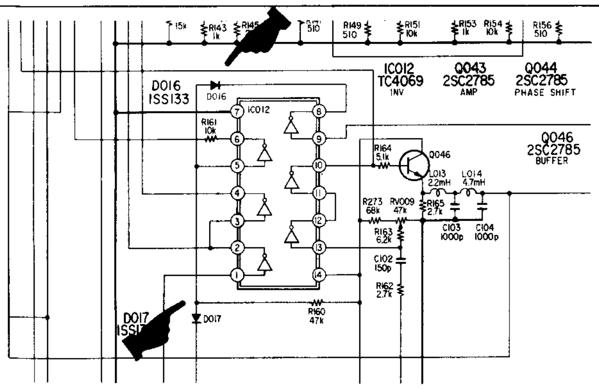
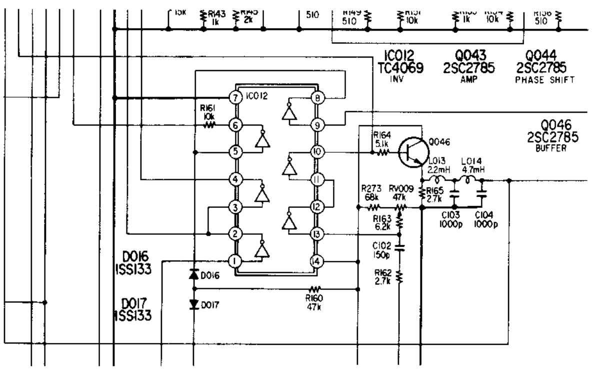
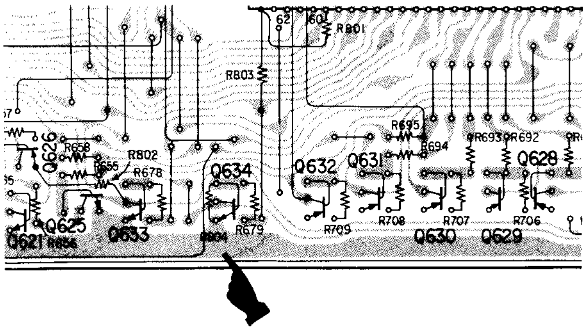
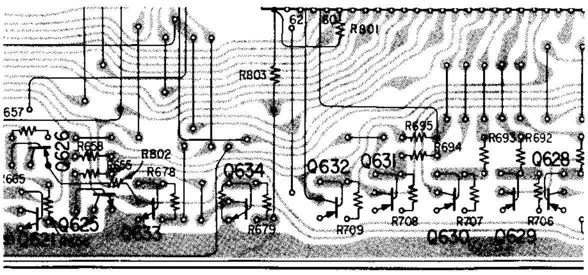
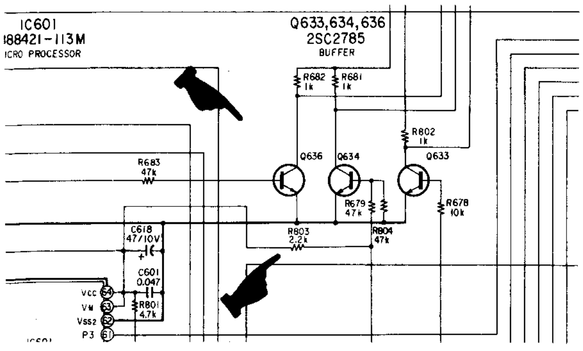
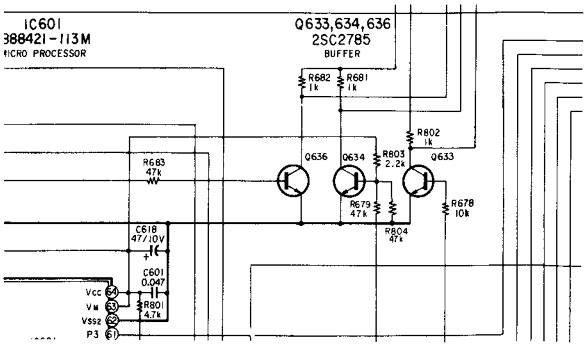
AEP Model
UK Model
E Model

November, 1983

# CORRECTION-1

## SERVICE MANUAL

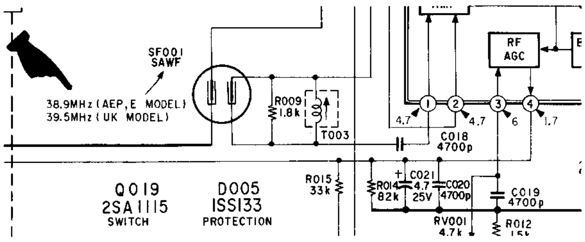
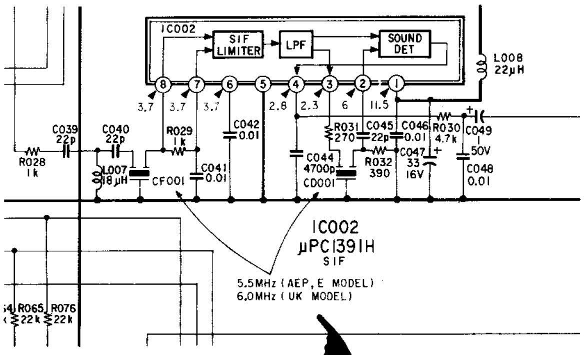
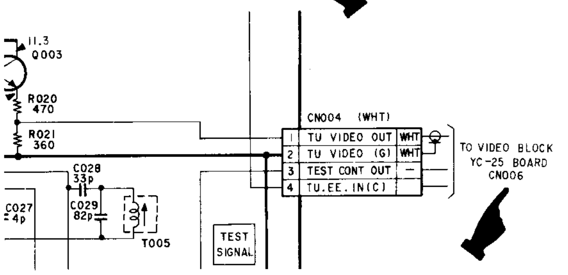
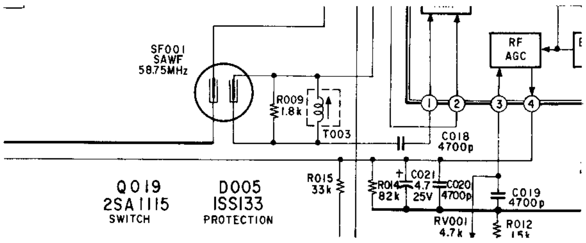
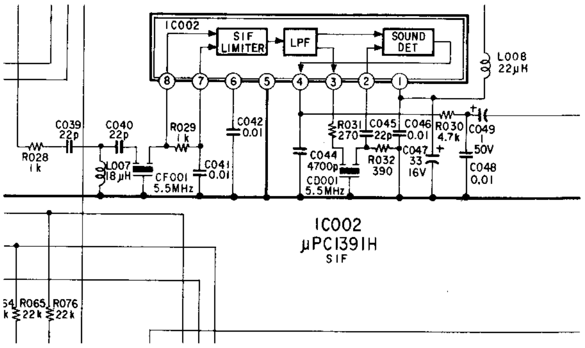
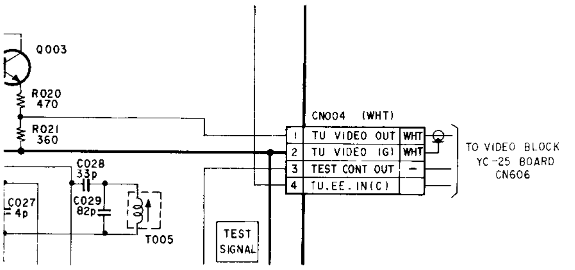
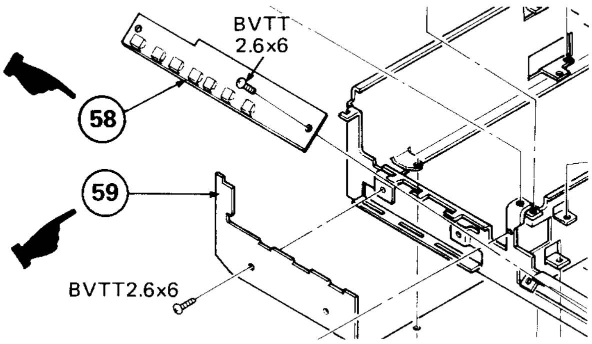
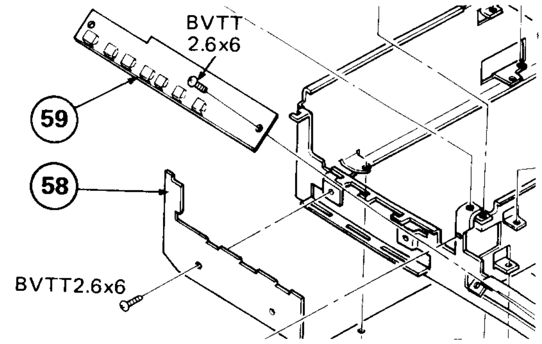
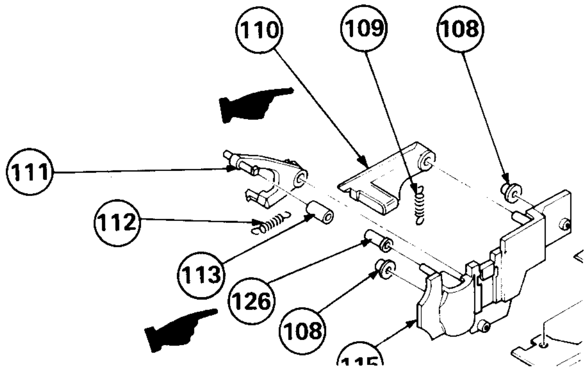
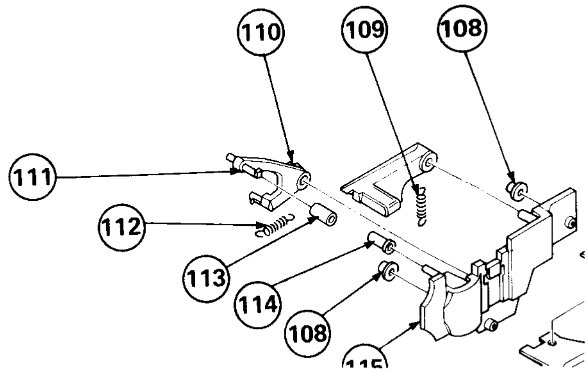
☛ : indicates corrected portions

| Page | Correct | Incorrect |
|---|---|---|
| 60 |  |  |
| 65 |  |  |
| 68 |  |  |

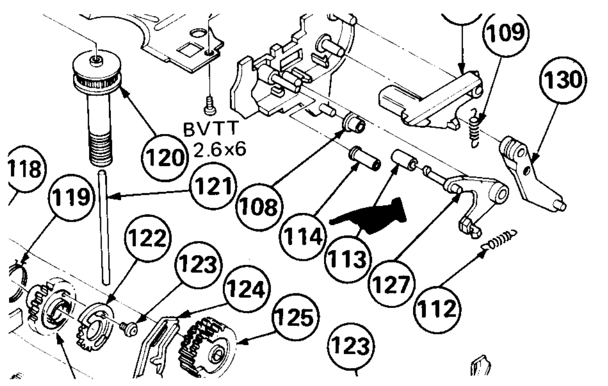
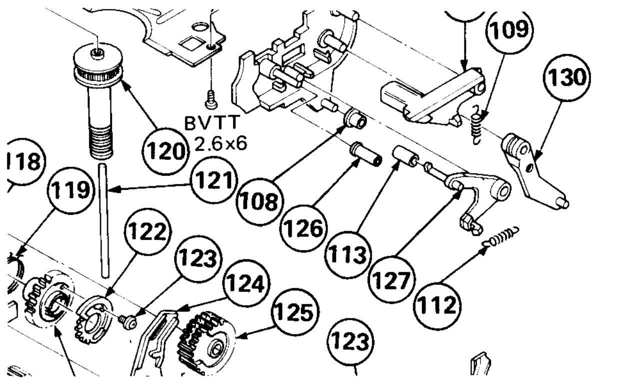
MICROFILM

Consumer
VIDEO

: indicates corrected portions

| Page | Correct | Incorrect |
|---|---|---|
| 78, 79 |  SF001<br>SAWF<br>38.9MHz (AEP, E MODEL)<br>39.5MHz (UK MODEL)<br>R009<br>1.8k<br>T003<br>RF<br>AGC<br>4.7<br>4.7<br>6<br>1.7<br>C018<br>4700p<br>Q019<br>2SA1115<br>SWITCH<br>D005<br>ISS133<br>PROTECTION<br>R015<br>33k<br>R014<br>82k<br>C021<br>4.7<br>25V<br>C020<br>4700p<br>C019<br>4700p<br>RV001<br>4.7k<br>R012<br> IC002<br>SIF<br>LIMITER<br>LPF<br>SOUND<br>DET<br>L008<br>22µH<br>3.7<br>3.7<br>3.7<br>2.8<br>2.3<br>6<br>11.5<br>C039<br>22p<br>C040<br>22p<br>R028<br>1k<br>L007<br>18µH<br>R029<br>1k<br>CF001<br>C041<br>0.01<br>C042<br>0.01<br>C044<br>4700p<br>CD001<br>R031<br>270<br>C045<br>22p<br>C046<br>0.01<br>R030<br>4.7k<br>C049<br>50V<br>R032<br>390<br>C047<br>33<br>16V<br>C048<br>0.01<br>IC002<br>µPC1391H<br>SIF<br>5.5MHz (AEP, E MODEL)<br>6.0MHz (UK MODEL)<br>R065<br>22k<br>R076<br>22k<br> 11.3<br>Q003<br>R020<br>470<br>R021<br>360<br>C028<br>33p<br>C027<br>4p<br>C029<br>82p<br>T005<br>CN004 (WHT)<br>1 TU VIDEO OUT WHT<br>2 TU VIDEO (G) WHT<br>3 TEST CONT OUT –<br>4 TU.EE.IN(C)<br>TO VIDEO BLOCK<br>YC-25 BOARD<br>CN006<br>TEST<br>SIGNAL |  SF001<br>SAWF<br>58.75MHz<br>R009<br>1.8k<br>T003<br>RF<br>AGC<br>C018<br>4700p<br>Q019<br>2SA1115<br>SWITCH<br>D005<br>ISS133<br>PROTECTION<br>R015<br>33k<br>R014<br>82k<br>C021<br>4.7<br>25V<br>C020<br>4700p<br>C019<br>4700p<br>RV001<br>4.7k<br>R012<br> IC002<br>SIF<br>LIMITER<br>LPF<br>SOUND<br>DET<br>L008<br>22µH<br>C039<br>22p<br>C040<br>22p<br>R028<br>1k<br>L007<br>18µH<br>R029<br>1k<br>CF001<br>5.5MHz<br>C041<br>0.01<br>C042<br>0.01<br>C044<br>4700p<br>CD001<br>5.5MHz<br>R031<br>270<br>C045<br>22p<br>C046<br>0.01<br>R030<br>4.7k<br>C049<br>50V<br>R032<br>390<br>C047<br>33<br>16V<br>C048<br>0.01<br>IC002<br>µPC1391H<br>SIF<br>R065<br>22k<br>R076<br>22k<br> Q003<br>R020<br>470<br>R021<br>360<br>C028<br>33p<br>C027<br>4p<br>C029<br>82p<br>T005<br>CN004 (WHT)<br>1 TU VIDEO OUT WHT<br>2 TU VIDEO (G) WHT<br>3 TEST CONT OUT –<br>4 TU.EE.IN(C)<br>TO VIDEO BLOCK<br>YC-25 BOARD<br>CN606<br>TEST<br>SIGNAL |
| 94 |  BVTT<br>2.6x6<br>58<br>59<br>BVTT2.6x6 |  BVTT<br>2.6x6<br>59<br>58<br>BVTT2.6x6 |
| 95 |  110<br>109<br>108<br>111<br>112<br>113<br>126<br>108<br>115 |  110<br>109<br>108<br>111<br>112<br>113<br>114<br>108<br>115 |

: indicates corrected portions

| Page | Correct | Incorrect |
|---|---|---|
| 95 |  109<br>130<br>BVTT<br>2.6x6<br>118<br>119<br>120<br>121<br>108<br>114<br>113<br>122<br>123<br>124<br>125<br>127<br>112<br>123 |  109<br>130<br>BVTT<br>2.6x6<br>118<br>119<br>120<br>121<br>108<br>126<br>113<br>122<br>123<br>124<br>125<br>127<br>112<br>123 |
| 99 | No. Part No. Description<br>301 A-6050-187 DRUM ASSY (DSH-35A-R)302,303,3<br>302 A-6760-066-B SPRING ASSY, TAPE RETAINER<br>303 A-6760-138-A DRUM ASSY, UPPER<br>304 3-669-157 BOLT (WASHER) (2.6X8)<br>305 A-6762-122-A DISK ASSY<br>[illegible] X-3669-105-0 SPACER BLOCK ASSY<br>307 X-2621-204-0 STATOR ASSY, D<br>308 X-2621-202-0 ROTOR ASSY, D<br>309 3-669-466-00 SCREW (M 2.6) | No. Part No. Description<br>301 A-6050-187-A DRUM ASSY (DSH-35A-R)302,303,3<br>302 A-6760-066-B SPRING ASSY, TAPE RETAINER<br>303 A-6760-119-A DRUM ASSY, UPPER<br>304 3-669-157-00 BOLT (WASHER) (2.6X8)<br>305 A-6762-124-A DISK ASSY<br>306 X-2621-204-2 SPACER BLOCK ASSY<br>307 X-2621-204-02 STATOR ASSY, D<br>308 X-2621-202-0 ROTOR ASSY, D<br>309 3-669-466-00 SCREW (M 2.6) |
| 109 | ****************************************************<br>♠:A-6713-175-A AM-3 BOARD, COMPLETE<br>********************<br>♠:3-681-180-00 CASE (MAIN), SHIELD, AM<br>♠:3-681-182-00 LID, BOTTOM, SHIELD CASE, AM<br>♠:3-681-181-00 LID, UPPER, SHIELD CASE, AM | ****************************************************<br>♠:A-6713-175-A AM-3 BOARD, COMPLETE<br>********************<br>♠:3-681-180-00 CASE (MAIN), SHIELD, AM<br>♠:3-681-182-00 LID, BOTTOM, SHIELD CASE, AM |
| 117 | DISCRIMINATOR<br>CD001 1-404-380-00 DISCRIMINATOR, CERAMIC 5.5MHz (AEP,E MODEL)<br>CD001 1-404-407-00 DISCRIMINATOR, CERAMIC 6.0MHz (UK MODEL)<br>FILTER<br>CF001 1-527-263-00 CERAMIC FILTER (5.5MHz) (AEP,E MODEL)<br>CF001 1-527-262-00 CERAMIC FILTER (6.0MHz) (UK MODEL)<br>CONNECTOR<br>CN001♠:1-560-892-21 PIN, CONNECTOR 4P<br>CN002♠:1-560-894-00 PIN, CONNECTOR 6P<br>CN003♠:1-560-895-00 PIN, CONNECTOR 7P<br>CN004♠:1-560-892-00 PIN, CONNECTOR 4P<br>CN005♠:1-560-893-00 PIN, CONNECTOR 5P<br>CN006♠:1-560-899-11 PIN, CONNECTOR 11P<br>CAPACITOR<br>CT001 1-404-134-00 TRAP, CERAMIC (5.5MHz) (AEP,E MODEL)<br>CT001 1-409-333-00 TRAP, CERAMIC (6.0MHz) (UK MODEL) | DISCRIMINATOR<br>CD001 1-404-380-00 DISCRIMINATOR, CERAMIC 5.5MHZ<br>FILTER<br>CF001 1-527-263-00 CERAMIC FILTER (5.5MHZ)<br>CONNECTOR<br>CN001♠:1-560-892-21 PIN, CONNECTOR 4P<br>CN002♠:1-560-894-00 PIN, CONNECTOR 6P<br>CN003♠:1-560-895-00 PIN, CONNECTOR 7P<br>CN004♠:1-560-892-00 PIN, CONNECTOR 4P<br>CN005♠:1-560-893-00 PIN, CONNECTOR 5P<br>CN006♠:1-560-899-11 PIN, CONNECTOR 11P<br>CAPACITOR<br>CT001 1-404-134-00 TRAP, CERAMIC (5.5MHZ) |
| 119 | FILTER<br>SF001 1-404-433-00 SAWF (AEP,E MODEL)<br>SF001 1-404-345-00 SAWF (UK MODEL)<br>TRANSFORMER<br>T001 1-404-068-00 COIL, VIF<br>T002 1-404-068-00 COIL, VIF<br>T003 1-404-207-00 COIL, VIF<br>T004 1-404-203-00 COIL, VIF | FILTER<br>SF001 1-404-433-00 SAWF<br>TRANSFORMER<br>T001 1-404-068-00 COIL, VIF<br>T002 1-404-068-00 COIL, VIF<br>T003 1-404-207-00 COIL, VIF<br>T004 1-404-203-00 COIL, VIF |

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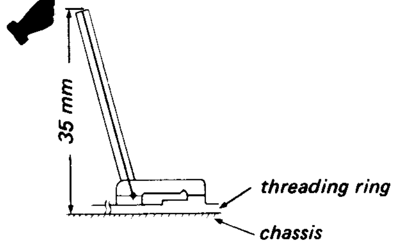
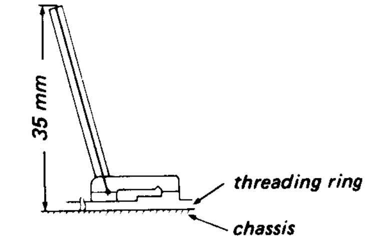
| 128 | A-6765-286-A COMMANDER ASSY (AEP MODEL/RED)<br>A-6765-287-A COMMANDER ASSY (AEP MODEL/WHITE)<br>2 2-290-603-00 CURSOR<br>3 ♠:2-290-630-0 STOPPER, HOLDER<br>4 X-2290-616 CASING ASSY (AEP MODEL/GRAY)(UK<br>X-2374-60 -0 CASING ASSY (AEP MODEL/SILVER)(E<br>X-2290-627-0 CASING ASSY (AEP MODEL/RED)<br>X-2290-626-0 CASING ASSY (AEP MODEL/WHITE)<br>5 2-290-633 0 PUSH BUTTON (M)<br>6 2-290-632- PUSH BUTTON (L) | A-6765-286-A COMMANDER ASSY (AEP MODEL/RED)<br>A-6765-287-A COMMANDER ASSY (AEP MODEL/WHITE)<br>2 2-290-603-00 CURSOR<br>3 ♠:2-290-630-00 STOPPER, HOLDER<br>4 X-2290-616-0 CASING ASSY (AEP MODEL/GRAY)(UK<br>X-2374-604-0 CASING ASSY (AEP MODEL/SILVER)(E<br>X-2290-626-0 CASING ASSY (AEP MODEL/RED)<br>X-2290-627-0 CASING ASSY (AEP MODEL/WHITE)<br>5 2-290-633-00 PUSH BUTTON (M)<br>6 2-290-632-00 PUSH BUTTON (L) |

## ADJUSTMENT MANUAL

| | | |
|---|---|---|
| 20 | **3-9. UNTHREADING CHECK**<br>1) Press the EJECT button and unthread.<br>2) Check that the actuator for the unthreading end switc not tripped as shown in Fig. 3-20. (Slowly rotate internal gear by hand and verify by the click sound.<br>* Refer to Paragraph 1-7-2 to thread manually. Adjust according to Paragraph 3-15-2 if necessary | **3-9. UNTHREADING CHECK**<br>1) Press the EJECT button and unthread.<br>2) Check that the actuator for the unthreading end switch not tripped as shown in Fig. 3-20. (Slowly rotate internal gear by hand and verify by the click sound.)<br>* Refer to Paragraph 1-3-2 to thread manually. Adjust according to Paragraph 3-15-2 if necessary. |
| 21 | 1) Unscrew the Phillips head continuous-thread step screw ①.<br>2) Remove the No. 6 guide nut ②, washer ③, spacer and compression coil spring ⑤. Use a special notc screwdriver. (See Section 1-8, Tools And Fixtures Requi<br>3) Remove the two guide adjusting nuts ⑥ and the A assembly and FE head. | 1) Unscrew the Phillips head continuous-thread step screw ①.<br>2) Remove the No. 6 guide nut ②, washer ③, spacer and compression coil spring ⑤. Use a special notc screwdriver. (See Section 1-4, Tools And Fixtures Requi<br>3) Remove the two guide adjusting nuts ⑥ and the A assembly and FE head. |
| 23 | **3-10-2. Removal of S Threading Ring (Fig. 3-23**<br>1) Remove the spring of the lock arm assembly. (Refe Paragraph 3-15-1, Fig. 3-34)<br>2) Remove stop washers ① and ring rollers ②, ③.<br>3) Remove the UTE switch subassembly. (Refer to Paragr 3-15-2, Fig. 3-38)<br>4) Unscrew screw ④ and remove the ring roller adjustm | **3-10-2. Removal of S Threading Ring (Fig. 3-23**<br>1) Remove the spring of the lock arm assembly. (Refer Paragraph 3-15-1, Fig. 3-33)<br>2) Remove stop washers ① and ring rollers ②, ③.<br>3) Remove the UTE switch subassembly. (Refer to Paragra 3-15-2, Fig. 3-34)<br>4) Unscrew screw ④ and remove the ring roller adjustm |
| 24 | **<To remount>**<br>*1) Loosely tighten the 1 x 3 tap-in screw.*<br>*2) Tighten the 1.4 x 3 tap-in screw all the way.*<br>*3) Adjust the 1 x 3 tap-in screw until the height is 35 mm. After adjustment, lock the screw.*<br>*Note: The no. 2 guide is up all the way.*<br> | **<To remount>**<br>*1) Loosely tighten the 1 x 3 tap-in screw.*<br>*2) Tighten the 1.4 x 3 tap-in screw all the way.*<br>*3) Adjust the 1 x 3 tap-in screw until the height is 35 mm. After adjustment, lock the screw.*<br>*Note: The no. 3 guide is up all the way.*<br> |

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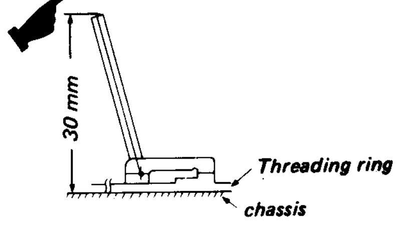
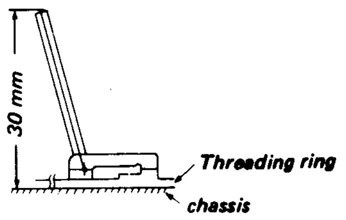
| 24 | **<To remount>**<br>*1) Loosely tighten the 1 x 3 tap-in screw.*<br>*2) Tighten the 1.4 x 3.5 tap-in screw all the way.*<br>*3) Adjust the 1 x 3 tap-in screw so that the height is 30 mm. After adjustment, lock the screw.*<br>*Note: The no. 3 guide is up all the way.*<br><br> | **<To remount>**<br>*1) Loosely tighten the 1 x 3 tap-in screw.*<br>*2) Tighten the 1.4 x 3.5 tap-in screw all the way.*<br>*3) Adjust the 1 x 3 tap-in screw so that the height is 30 mm. After adjustment, lock the screw.*<br>*Note: The no. 2 guide is up all the way.*<br><br> |
| 33 | **Note:** After the indicated tape path adjustments that f have been successfully completed using normal play speed, operate the VCR in the Speed Search mode look for curl at the tape guides. Readjust the necessary. Then, finally, playback a regulator L830 as a check-up. See Section 4-4.<br>2) Turn No. 6 guide counterclockwise to free tape transp tion to the drum. Use a special notched screwdriver. Section 1-8, Tools And Fixtures Required)<br>3) Loosen No. 5 guide lock screw ①, turn No. 5 guide so the entrance side waveform is almost flat, as shown i figure below, and tighten lock screw ①. (See Fig. 4 | **Note:** After the indicated tape path adjustments that fol have been successfully completed using normal playb speed, operate the VCR in the Speed Search mode a look for curl at the tape guides. Readjust them necessary. Then, finally, playback a regulator L830 t as a check-up. See page 4-9.<br>2) Turn No. 6 guide counterclockwise to free tape transpo tion to the drum. Use a special notched screwdriver. ( Section 1-4, Tools And Fixtures Required)<br>3) Loosen No. 5 guide lock screw ①, turn No. 5 guide so t the entrance side waveform is almost flat, as shown in figure below, and tighten lock screw ①. (See Fig. 4- |
| 36 | *Fig. 4-8.*<br>Turn the tracking control knob counterclockwise to lower the RF output waveform to about 60% of the maximum. Play back the tracking portion of the alignment tape KR5-2H, raise No. 7, 8 guides about 0.3 mm, and check the exit free waveform of the RF output waveform.<br>**Note:**<br>Be sure that the tape does not touch the bottom flange of the ACE assembly.<br>i) If the waveform is within the range illustrated in Fig. 4-7(a), (b), proceed with the adjustment.<br>ii) If the exit free waveform appears as shown in Fig. 4-9, turn the ACE lateral adjustment screw clockwise until the waveform is within the range illustrated in Fig. 4-7(a), (b).<br>iii) If the exit free waveform appears as shown in Fig. 4-10, turn the ACE lateral adjustment screw counterclockwise to obtain the waveform shown in Fig. 4-9, then turn clockwise again until the waveform is within the range shown in Fig. 4-7. | *Fig. 4-8.*<br>Turn the tracking control knob counterclockwise to lower the RF output waveform to about 60% of the maximum. Play back the tracking portion of the alignment tape KR5-2H(868-54), raise No. 7, 8 guides about 0.3 mm, and check the exit free waveform of the RF output waveform.<br>**Note:**<br>Be sure that the tape does not touch the bottom flange of the ACE assembly.<br>i) If the waveform is within the range illustrated in Fig. 4-7(a), (b), proceed with the adjustment.<br>ii) If the exit free waveform appears as shown in Fig. 4-10, turn the ACE lateral adjustment screw clockwise until the waveform is within the range illustrated in Fig. 4-7(a), (b).<br>iii) If the exit free waveform appears as shown in Fig. 4-10, turn the ACE lateral adjustment screw counterclockwise to obtain the waveform shown in Fig. 4-9, then turn clockwise again until the waveform is within the range shown in Fig. 4-7. |

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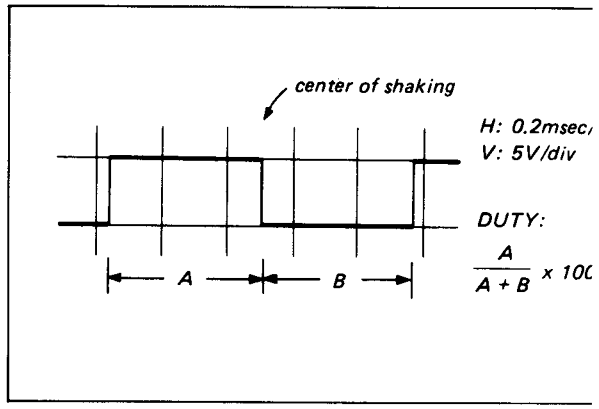
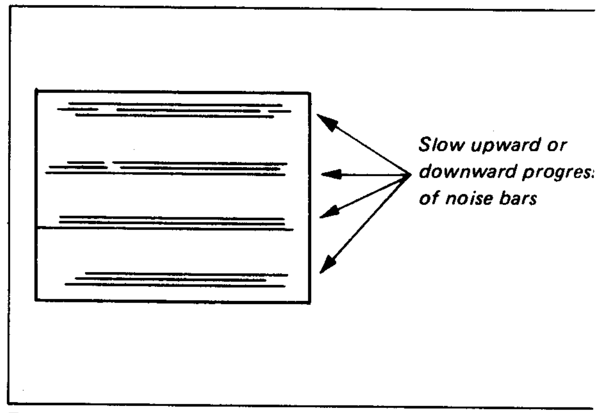
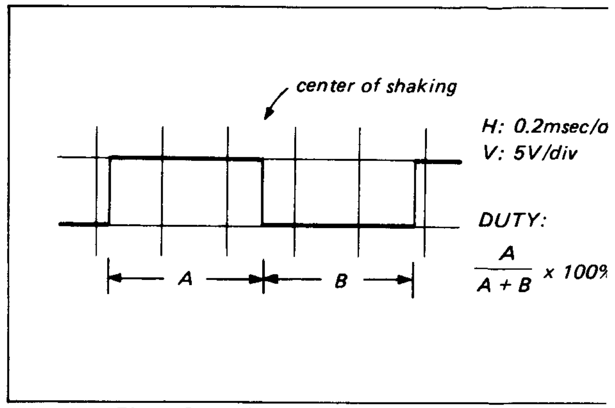
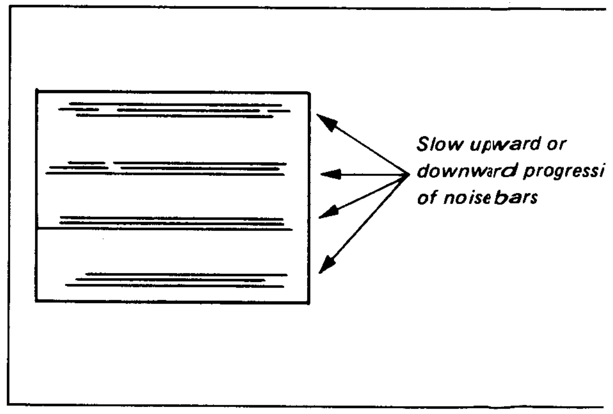
| 44 | <br> center of shaking<br>H: 0.2msec/<br>V: 5V/div<br>DUTY:<br>A / A + B x 10<br>A<br>B<br>*Fig. 5-10A. Capstan DC bias adjustment*<br>2) PICTURE SEARCH, Capstan DC Bias Adjustment ( Board)<br>Mode: PICTURE SEARCH (FWD)<br>Signal: Alignment tape colour bar or mono<br>**[Adjustment method]**<br>i) Set up the picture search (forward) mode and a with RV308 so that the progression of noise becomes as slow as possible. (See Fig. 5-10B.)<br>ii) Set up the picture search (reverse) mode and that noise bars do not progress very quickly.<br><br> <br>*Fig. 5-10B. PICTURE SEARCH, capstan DC bias adju* | <br> center of shaking<br>H: 0.2msec/<br>V: 5V/div<br>DUTY:<br>A / A + B x 100<br>A<br>B<br>*Fig. 5-9. Capstan DC bias adjustment*<br>2) PICTURE SEARCH, Capstan DC Bias Adjustment (S Board)<br>Mode: PICTURE SEARCH (FWD)<br>Signal: Alignment tape colour bar or monos<br>**[Adjustment method]**<br>i) Set up the picture search (forward) mode and a with RV308 so that the progression of noise becomes as slow as possible. (See Fig. 5-10.)<br>ii) Set up the picture search (reverse) mode and c that noise bars do not progress very quickly.<br><br> <br>*Fig. 5-10. PICTURE SEARCH, capstan DC bias adjust* |

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